

How Good Are the Russians? Bonner's Smog Hog for RC!

FEBRUARY 1967 — 35 CENTS

MODEL AIRPLANE NEWS



IN COMBAT- ~~FOX~~ fire power WINS

IT'S NEW!

IT'S DIFFERENT!

IT'S BEST!



FOX COMBAT SPECIAL

The World's Most Powerful 35

\$19.95

Dear Fellow Model Builder:

Since the introduction of our Fabulous Stunt 35 we have been constantly studying, experimenting and working to learn more about building fine motors.

Dozens of experimental motors were built, and hundreds of experiments were conducted to build our store of knowledge.

Now to fill a growing need for an ultra high performance motor we have created an all new 35. We have incorporated features never before used, to produce the fastest, the most powerful, and the most durable 35 the world has known.

This is a motor that will inspire you to build better, fly better and win more.

More power to you,

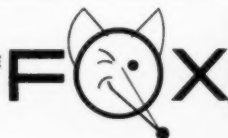
Duke Fox

HERE IS THE BOX SCORE

Look at this chart and compare. In the second and third columns are the features you have in the New Fox Combat 35. In the following columns, marked A, B, C, etc., are competitors of Fox in order of their sales.

	FEATURES YOU SHOULD HAVE	FOX 35 COMBAT SPECIAL	A	B	C	D
1	ONE PIECE CRACK-UP RESISTANT CRANKCASE	YES	NO	YES	NO	NO
2	HARDENED STEEL CRANKSHAFT	YES	NO	NO	YES	YES
3	GROUND CRANKPIN	YES	NO	NO	NO	YES
4	BLOWOUT PROOF HEAD GASKET	YES	NO	NO	NO	NO
5	3 POINT SUPPORT ON NEEDLE VALVE	YES	NO	NO	NO	NO
6	TCC DESIGN (ORIGINATED BY FOX)	YES	NO	YES	NO	NO
7	SPLINED-SERRATED-HARDENED NON SLIP THRUST WASHER	YES	NO	NO	NO	NO
8	OPTIONAL EXHAUST VALVE	YES	NO	NO	NO	NO
9	OFFSET CYL DESIGN	YES	NO	NO	NO	NO
10	20,000 RPM BREATHING CAPACITY	YES	NO	NO	NO	NO
11	AIRCRAFT QUALITY BRONZE MAIN BEARING	YES	NO	NO	NO	NO

SMART CHAMPIONS CHOOSE



FOX MANUFACTURING CO., Inc.

Designers and Manufacturers of the World's Finest Model Airplane Motors
1219 N. 32nd STREET, FORT SMITH, ARKANSAS

THE THRILL OF BUILDING— THE FUN OF FLYING

GET THEM BOTH IN THE

COMET LINE

ALL-PLASTIC READY-TO-FLY U-control SCALE GAS MODEL



Complete
with Horkimer
1/2A .049B Gas
Engine with
"Auto-Recoil"
Starter

The **Mustang F51**

KIT
PLM-45

\$12.95

Wingspan—16"
Length—13 1/2"
Weight—
approx. 7 1/2 oz.

Comet's inspired U-Control SCALE GAS MODEL of the fighter plane that made history! Big—beautiful—truly ready-to-fly—needs no "building"! High-impact plastic in a striking two-tone color scheme, complete with engine and starter, in a handsome chest. Big 16" wingspan—and a terrific value!

THE **Sabre 44** ALL-PLASTIC READY-TO-FLY U-CONTROL GAS MODEL

Complete with
Horkimer 1/2A
.049B
Gas Engine

Nothing to build—
Ready-to-fly

KIT
PLM-44



\$9.95

Wingspan—16"
Length—14 1/4"
Weight—6 1/4 oz.

Easily the most popular model of its type! High-impact plastic in vivid colors for beauty and durability; swept-back wing design and powerful engine for breathtaking performance. Nothing to assemble—complete with engine—ready-to-fly! Stunning, colorful protective chest!

Build It Yourself!

U-control Model **ROOKIE TRAINER**



KIT T-6

A control model so simple, so accurate in design that it can be built and flown by any beginner! Yet it's so sensational in performance that it satisfies even the expert! Fuselage parts, wing, stabilizer and rudder are SHAPED, motor mount shaped and drilled; kit includes landing gear, wheels, etc.—amazingly complete! Suitable for Class "B" or "C" engines; class III, IV and V. Wingspan 35 1/2".

\$3.50

THE "Y" LINE

In Balsa— Flying Scale Models

KIT Y-11
DOUGLAS
D558-1
SKYSTREAK



\$1.29

Comet's "Big Value" models with giant 24" to 54" spans are rubber-powered, but adaptable for use with 1/4A or "Jetex" engines. Terrific performers—12 popular models, including famous jets and fighters.

Model Building Builds Model Boys

PAINTS for PLASTICS

In a "SET-OF-SEVEN" or in generous individual 10¢ jars! Choice of 14 Sparkling Colors!

Dries to the touch in 5 minutes—thoroughly dry in 20 minutes! Individual 10¢ jars—14 sparkling colors. "Set of Seven" in handy container....

only **69¢**
complete



COMET CEMENT for PLASTICS

Comet's special cement for joining plastic parts; dries fast, holds tight, colorless. Turns out better finished models. Repairs elastic objects. In smart, colorful tube.

10¢
and **25¢**

COMET CEMENT

Made especially for model building by Comet, which knows what model-builders need, because it produces more model airplanes than anyone else! Big 10¢ tube; giant 15¢ and 25¢ sizes. Comet also offers an Extra-Fast-Drying Cement.

10¢
15¢
25¢



COMET DOPE

Full range of newest, truest colors; top quality. Big jar for 10¢. Covers beautifully, flows on smoothly; dries quickly, resists separation and hardening.

10¢



COMET MODEL HOBBYCRAFT, INC.

501-05 WEST 35TH STREET • CHICAGO 16, ILLINOIS



'SIMULTANEOUS'

ORBIT

SIMULTANEOUS EIGHT-CHANNEL RADIO CONTROL

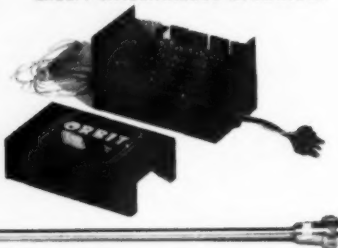
THE MOST ADVANCED RADIO EQUIPMENT AVAILABLE
If you have ever longed to control that rudder while holding elevator or simultaneously control ailerons & elevator then this equipment is for you!

Receiver has one tube (110 Mil. Filament) & two transistors. Weight 9 ounces. Designed to operate on 30 volt hearing aid and one 1 1/2 volt pencil.

Transmitter features complete stability. No more adjusting tones. Once tuned, it stays.

"Orbit" Eight-Channel Receiver	\$119.50
"Orbit" Eight-Channel Simultaneous Transmitter	98.50
"Orbit" Five-Channel Receiver	107.50
"Orbit" Five-Channel Simultaneous Transmitter	93.50
"Orbit" Eight-Channel Standard Transmitter	79.50
"Orbit" Five-Channel Standard Transmitter	74.50

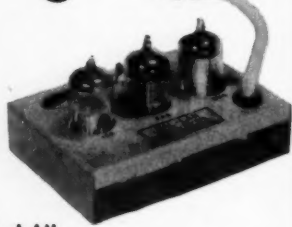
THE STANDARD TRANSMITTER FEATURES EVERYTHING EXCEPT SIMULTANEOUS OPERATION.



"DUNHAM'S"

10417 Long Beach Blvd. • Lynwood, Calif.

LOOK !!



The
KAL-LAN
Audio Tone Receiver Kit
Features

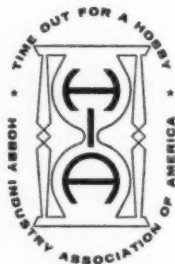
- ★ Etched Circuit ★ Light Weight
- ★ Pre-Wound Coil ★ Long Range
- ★ Hard Tubes ★ Dependability
- ★ Low Battery Drain

RUGGED, FOOL PROOF DESIGN Provides SIMPLICITY-PLUS For FAST, EASY Assembly. (Approx. 2 Hours). Will Operate with any 27.255 Mc. Audio Tone Transmitter.

RECEIVER KIT Model ECR-120	
less tubes & relay.....	14.95
TUBE KIT (3A5, 1S5, 3V4).....	3.95
JAICO GEM RELAY.....	4.95
RECEIVER KIT complete with tubes & relay.....	22.95
25% Deposit on C.O.D. Orders	
Wash. Res. include 3-1/3% Sales Tax	

KAL-LAN CONTROLS CO.
8547 S. 123rd Pl.
Seattle 88, Wash.

THE FRIENDLY DEALER Who Displays This Emblem



Is a member of

the
HOBBY INDUSTRY ASSOCIATION

He is well qualified
to serve you

**HOBBY INDUSTRY ASSOCIATION
OF AMERICA, INC.**
1528 Walnut Street
Philadelphia 2, Pa.

Contest Calendar

Enter or visit these meets.

JANUARY

20-Phoenix, Ariz.: Record Trials for OR, FFG, OHLG, TLG, CLE and CL. Quentin T. Webster, C.D., 521 E. Camelback Rd., Phoenix, Ariz.

FEBRUARY

3-Green Bay, Wisc.: Class AA Third Annual Winter Jamboree for FFG, TLG and RC. R. L. Cowles, C.D., 224 Oakhill Drive, Green Bay, Wisc.

24-Phoenix, Ariz.: Class AAA 7th Annual Southwestern Regional Model Airplane Contest for FFG, CL, OR, TLG, OHLG, CLS, CLC, CLFS and RC. Quentin T. Webster, C.D., 521 E. Camelback Rd., Phoenix, Ariz.

INTERNATIONAL COMPETITION NEWS

► This magazine has been kind enough to provide space every month so that the many FAI modelers may get the latest accurate information regarding events for the coming season. To put everyone at ease, there will be no rule changes for the 1957 elimination system. Rules that applied in 1956 will still be in effect. Dates for 1957 team selections by elimination will be made—Local eliminations, May 25-26th, 1957; Semi-finals, June 15-16, 1957. These dates will apply for the entire country.

The December 1956 FAI meeting in Europe was to decide many important items, including any rule and specification changes, finals dates and sites, and the problem of combining finals events. Reports on this meeting will be made public as soon as they become known.

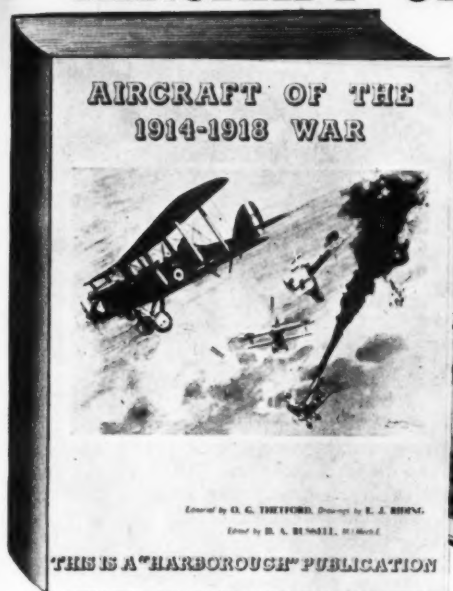
By sampling opinions of the semi-finals entrants last spring, it was evident that the majority would prefer to hold elims during the months when weather is generally better. The advantages of selecting teams well in advance are numerous. To accomplish this end, the Committee has evolved a major change in the eliminations system. The changes will take place after the picking by elimination of the U.S.A. 1957 International Teams. In effect, this means that there will be two series of elims this coming season. The eliminations to pick the 1958 teams will be as follows: 1958 Local elims, August 24-25; 1958 Semi-finals, September 28-29.

Rules and specs for the August and September meet may not be the same as the earlier meets. This goes back to the FAI model in the May and June contests, would decide any rule changes.

To sum up: You can fly your last year's FAI model in the May and June contests, but chances are you will have to build new models to meet the specs for the August and September meets. All 1957 team members will automatically by-pass the August meet and be eligible to compete in semi-finals.

Questions, ideas, and queries for information will be welcomed. Write to Ed Dolby, 25 Exchange St., Rockland, Mass. ED DOLBY
ACADEMY OF MODEL AERONAUTICS
International Competition Committee

"AIRCRAFT OF THE 1914-1918 WAR"



SOLD ON 10 DAY MONEY BACK GUARANTEE

CONTENTS: Eighty aircraft flown by nations in the 1914-18 War are each described with a large photograph and full set of 1/72" scale three-view drawings. Wing and fuselage sections given. Complete dimensions, weight, armament, performance and power plant are given for each. "Operational History" of each plane is told in great detail. These Photos and Drawings are a must for all solid model and scale model builders.

IN ADDITION: a further 24 Aircraft are described with large photo, complete dimensions, weight, armament, etc. As with the first 80 Aircraft, full information is given as to the squadrons that these planes were issued. Yet another 94 more British, German, and French are shown of the "Experimental" and "Rare" types.

THIS BOOK WILL INTEREST All Pilots and Air Service men who flew in both World War I and II, as it is the most complete book ever sold on the most popular of all Aircraft ever built, those planes of yesterday, known and loved by Pilot and Model Builder alike. We cannot stress the value of this book too strongly, it is a "History" book, a "Scale Model Book", a "Picture Book" a "Design and Engineering Book" all rolled into one. All pages are on high quality paper, cloth bound, Gilt Block Title. Pages are large 11"x9". The weight of the book is almost 2 pounds. Sold on 10 day money back guarantee.

PLANS: The plans are all drawn to same 1/72" scale be they Bomber or Fighter type. Fighter type cover full page, the Bombers being larger are drawn on Double size pages that fold out from the book approximately 9"x20" These are a must for all scale builders. Every conceivable plan is given; Spads, Fokkers, Nieuports, BE 2 C, Bleriot, Rumpler Taube, Curtis Jenny, these are just a few.

PHOTOGRAPHS: 234 large photos of every Airplane Flown in WW I, plus additional photos of rare and seldom seen experimental planes. These are all large and clear ranging from 1/3 size of page on up to full page photos. Complete squadron photos are also shown in great detail. These photos alone worth more than book price.

SEND \$2.95 FOR THIS \$11.95 BOOK

Place me on order for "Aircraft of the 1914-18 War" book. I enclose \$2.95 and agree to pay the remaining \$9.00 in 3 monthly payments of \$3.00 each ☐

Send me the "Aircraft of the 1914-18 War" book. I enclose full \$11.95 ☐

Sample pages, large 2 color folder about above book 25c ☐

COMPANION BOOKS TO THE "14-18" BOOK

"AIRCRAFT CAMOUFLAGE and MARKINGS 1907-54" \$11.95 ☐
Sample pages and folder about above book 25c ☐

"PICTURE HISTORY of FLIGHT" \$11.95 ☐
Sample pages and folder about above book 25c ☐

"PLANSBOOK" contains over 1,500 different plans of World War I and II Models plus Wakefield Models, Radio Controlled Models, Radio Controlled Boats, etc. Each "Plansbook" comes with \$1.00 credit voucher good for future purchases. **\$1.00** ☐

"BOOK REVIEW" contains listings, photos, sample pages of over 200 Model Aircraft, Real Aircraft, Boat, Auto, Train, Radio Control and Control Line Books, plus Aircraft War Stories, etc. Each "Book Review" comes with \$1.00 credit voucher good for future purchases. **\$1.00** ☐

CHECK OFF BOOKS YOU WANT ABOVE, SEND PAYMENT WITH ORDER, Add 25c PER book postage.

Print your name and address PLAINLY in the column of this ad.

GULL MODEL AIRPLANE CO. 10 E. OVERLEA AVE. DEPT. MO BALTIMORE 6, MARYLAND

MODEL AIRPLANE NEWS

JAY P. CLEVELAND, President and Publisher

FEBRUARY 1957

Vol. LVI—No. 2

CONTENTS

CONSTRUCTION

Guardian in Styrofoam	12
The Smog Hog	18
Strato-Liner	22
Symmetrical RC	34

ARTICLES

How Good Are the Russians?	9
Bill Brown's Brainchild	16
Dehormalizers	21
Theory and the Stunt Model	25
Make That Model Fly	28

FEATURES

Contest Calendar	2
International Competition News	2
MAN at Work	4
Air Ways	14
Radio Control News	30
Foreign Notes	36

WILLIAM WINTER, Editor
WITTICH HOLLOWAY, Art Director

Contributing Editors: Peter Chinn (England),
Don Grout, Ed Lorenz, Ted Martin,
Bruce Wennerstrom, Harry Williamson

Executive and Editorial Office:
551 Fifth Avenue, New York 17, N. Y.

Advertising Manager, N. E. Slane, 551 5th Ave.,
New York 17; West Coast Adv. Mgr., Justin
Hannon, 4710 Crenshaw Blvd.,
Los Angeles 43, Calif.

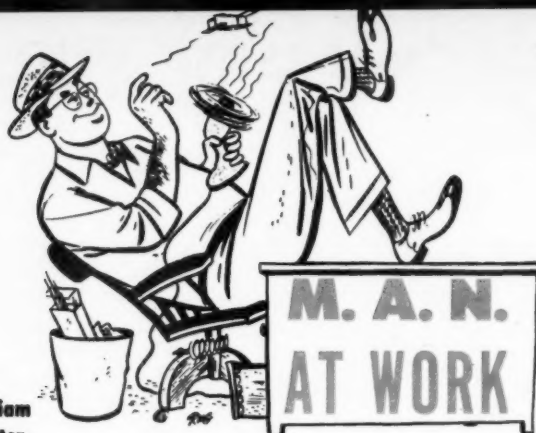
Published Monthly by Air Age, Inc. Editorial and
Business Offices: 551 Fifth Ave., New York 17, N.Y.
Jay P. Cleveland, President and Treasurer; V. P.
Johnson, Vice Pres.; G. E. DeFrancesco, Sec. Entered
as Second Class Matter at the Post Office at
Columbia, Missouri.

Price 35c per copy in U. S. Subscription Prices—U. S.
and possessions: 1 yr. \$3.50; 2 yrs. \$5.50; 3 yrs.
\$7.50; Canada: 1 yr. \$4.00; All other countries: 1 yr.
\$5.00. Payment from all countries except Canada must
be in U. S. funds. Change of Address—Send to MODEL
AIRPLANE NEWS, Subscription Department, 551 Fifth
Avenue, New York 17, New York, at least one month
before the date of the issue with which it is to take ef-
fect. Send old address with the new, enclosing if possible
your address label or copy. The Post Office will not for-
ward copies unless you provide extra postage. Duplicate
issues cannot be sent.

Copyright 1956 by Air Age, Inc.

Printed in U. S. A.

by
William
Winter



► More than one manufacturer of plastic model airplane kits is moaning about the supposed lack of interest of American youth in building and flying model airplanes. Plastic models are sold by the millions, along with other toys, through many hundreds of jobbers and distributors. It takes as many as 300,000 sales to break even. The "flying" model, in the viewpoint of people who make the plastics, is something you have to build and people won't build anything. (It sez here.) It is argued that boys must be interested in scale and not flying—but forgotten are the words, flying scale, which always has been the greatest interest of magazine readers.

There is, in fact, little doubt that plastic models have supplanted the old-fashioned solid and other mass produced quickie glue-and-stick models, many of which were doomed anyway. Some solids were good, and so were some cheap fliers. But too many were stinkers, and that is no way to run a railroad. In the day of the cheap flier, the then biggest manufacturer told us that 93% of its products were never completed. Nobody's fault, that's just the way it was. It boiled down to millions of kids wanting to make airplanes and the in-

dustry as a whole never being able to solve the riddle of how to design and kit an airplane that could be put together, and then have it fly. You can put a plastic model together—no one can deny it.

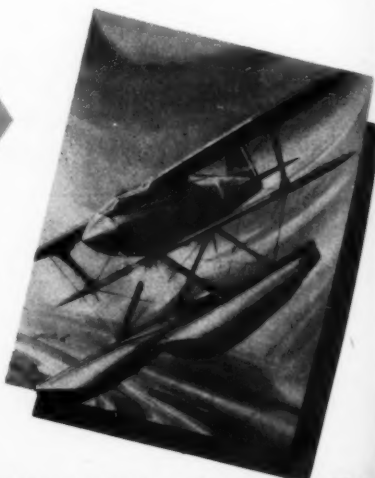
Even at its best, the built-up model can never be sold on the scale that plastics are sold. Too many "burned" merchandise buyers remember sad experiences with old-fashioned kits. Hobby jobbers push along the line of least resistance. It doesn't make a difference to the average dealer as long as the item sells. A built-up model of a jet, with flimsy bulkheads and scrawny stringers is rough on junior who never before saw a model airplane but the same jet in plastics can be at least stuck together into a recognizable object.

It is sad indeed that any manufacturer could believe that people won't build model airplanes. The news must perplex other manufacturers who make wood kits, gas engines, accessories, to the suppliers of wood and cement like Testor, and so on. It is also news to MAN. More kids than ever, and at a lower age level than ever, want to build models. They want plans, ask (Continued on page 7)

NEXT MONTH'S COVER
CURTISS NAVY RACER

PLANE ON COVER

For a change of pace, and a respite for airplane artist Jo Kotula, this February cover is a color photograph of a model airplane. It is the latest thing in radio-controlled jobs, a biplane by Ray Downs. Light wing loading for better stunting is behind the idea.



OK

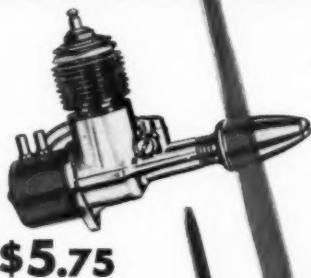
There's a "Cub" Engine for Every Power Application!

Priced from \$4.75 to \$12.95

"OK" Engines available in a complete series from .049 to .35 . . . all proved champions in control line, free flight, radio control and stunt flying. Top flight champions in value for over 19 years.

CUB .049B

Here's a flashy performer with plenty of power for general flying. Has both radial and lug mountings. It's versatile, comes already assembled. Complete with fuel tank, prop and spinner.



\$5.75

CUB .049A

Here's the very latest in this popular series, ideal for both free and control line flight. Mounts flush on the face of the plane, features new lightweight, over-size fuel tank for extra range.



\$5.75

CUB .049B POWER KIT

Know your engine . . . assemble it yourself! Learn your engine from the inside out . . . and save \$1.00! Includes all the parts and complete instruction for assembling the Cub .049B.



\$4.75

"OK" GLOW PLUGS

"OK" GLOW PLUGS have a superior platinum glow element for fast starts, ease of acceleration, highest speed. Available in two sizes.



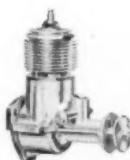
59c



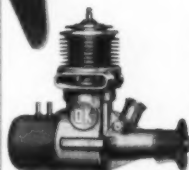
"OK" CUB .074
\$5.95



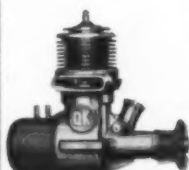
"OK" CUB .099
\$6.95



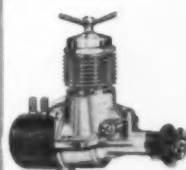
"OK" CUB .14 **\$7.95**
"OK" CUB .19 **\$7.95**



"OK" CUB .29
\$11.95



"OK" CUB .35
\$12.95



"OK" CUB DIESEL
.049 **\$6.95**
.075 **\$7.95**



Blended for Long Engine Life and Top Performance . . .

OK GLOW FUEL for Miniature Engines

Specifically developed to give maximum life and performance with all OK engines (and other engines of similar compression ratios), OK Glow Fuel is a scientifically compounded methanol-base fuel, heavily fortified with nitrates. Contains high heat resistant silicone lubricants that won't thin under engine heat. Easy starting. Ideal for breaking-in purposes.

½ Pt. 50¢; 1 Pt. 85¢; 1 Qt. \$1.50

and

OK DIESEL FUEL for Cub Diesels

A scientifically blended fuel to match thermal range of OK Cub Diesels. Assures "on time" firing and complete combustion without varnish or residue. Heavily fortified with high heat resistant lubricants for long engine life and top performance under varied climatic conditions.

Pint 85¢



HERKIMER TOOL & MODEL WORKS, Inc.
88 HARTER STREET
HERKIMER, NEW YORK

the hobbyist's SUPERMARKET of super NEW AND OLD ITEMS ...if available anywhere WE'VE GOT EM!

WORLD'S LARGEST HOBBY MAIL ORDER HOUSE... SINCE 1931

Only AHC Gives You All These Terrific EXTRAS

1. One year subscription to Model Airplane News, Air Trails and Flying Models or their equivalent value to our regular customers.
2. 14-Day Money Back guarantee on unused purchases.
3. BONUS TERMS with every engine (\$3.95 or over) purchased. Includes: Correct Size Propeller, Glo Engine Handbooks, etc.
4. BONUS ITEMS with Glo Engines (valuing at over \$1.95) includes: Construction Manual, Rubber Wheels, Insulin, etc.
5. No postage or packing charges for orders over \$2.00 (include 25c if order is under \$2.00). We insure safe delivery ANYWHERE IN THE WORLD. Outside of U.S.A. (except APO & FPO) add 10% for postage (minimum 50c).
6. Membership in "Modelers of America," the club that gives you up to date on gas modeling and SAVES YOU MONEY ON YOUR PURCHASES. Over 100,000 members!
7. No "minimum" orders. Any order is welcome.
8. 24-hour service. Mail addresses coast-to-coast airmail you also to our N.Y. office for immediate shipment to you.
9. Most complete model stock in America—gas, rubber, wild, etc. If it's advertised, we can usually supply it.
10. Comprehensive understanding of your modeling problems.
11. 64 page giant 2-color illustrated catalog FREE with every order.

SATISFACTION GUARANTEED OR YOUR MONEY BACK

FREE-FLIGHT PLANES ACCESSORIES

PLASTIC MODELS

READY-TO-RUN

COMPLETE WITH ENGINE

MODEL BOATS

WHY ORDER FROM ANY MANUFACTURER?

ORDER FROM AHC AND GET

FREE PREMIUMS

25% OFF

U-C ACCESSORIES

HOW TO ORDER

SEND PAYMENT IN FULL. NO POSTAGE, NO C.O.D.'S.

AMERICA'S HOBBY CENTER

READ THIS ENTIRE MAGAZINE FROM COVER TO COVER

EVERYTHING ADVERTISED CAN BE ORDERED FROM AHC.

AMERICA'S HOBBY CENTER, INC.

1931-26th YEAR 1957

Branches Coast-to-Coast

AMERICAN'S Largest Source of Models & Supplies

WE ALSO SELL TO DEALERS

MOD-AD AGENCY, INC.

1464 West 22nd Street, New York 11, N.Y.

1464 West 22nd Street, New York 11, N.Y.

1464 West 22nd Street, New York 11, N.Y.

1464 West 22nd Street, New York 11, N.Y.

MAN at Work

(Continued from page 4)

questions by the thousands. The demand for information is crushing. For those manufacturers who grew to the stage where they could compete in the toy field, we are happy. But, having defaulted the model airplane field is no justification for off-base assumptions that kids don't like to build and fly model planes. Maybe the trade, or some segments of it, has lost its way, or lost the answers, but any statement that air-minded American youth isn't interested in building flying models, to put it mildly, is confusing as a dead booster battery. The same voices will tell you that we should have modeling in the schools. If it doesn't exist, how can we have it? Impressive argument.

► Plans for the ME-109 Stunter, November 1956, should have said that the left, inside wing is 1½ inches longer than the right, for a total span of 48 and not 49½ inches. . . . Interesting pix, stunt jobs and builders, from the Prop Jockeys, Vero Beach, Fla. If you live thereabouts, contact Dennis Wood, Woody's Hobby Horse, 1606 24th Ave., Club papers everywhere are still giving Nats blow-by-blow reports. The Flite Master, Lakewood, Ohio, had some tidbits: After a jet crack-up, Johnnie Smith quoted words of wisdom from Texan, Dale Kirm—in the Texas winds you need great big tails. And, re the flies, Smith figures you almost have to fly multi-engine to win in scale. That winning B-36 had six Torp .19's, four Jetex Scorpions, and got 150 points for engine detail alone. Combat was hairy, said Smith, what with pressure tanks, hot engines, and 100 mph plus speeds. Better check up on trends in combat engines.

"I take exception to your statement 'why penalize a Cub for being good, or a guy for building one' in your comments on the proposed rules changes for flying scale free flight, MAN, Dec., 1956," tees off Bob Evans, Inglewood Flightmasters, but speaking for himself. "Our 1956 rules were initiated to preclude the tremendous advantage gained by merely building a high-wing monoplane, to stimulate 'contest fever' in the fly for fun boys, and to attract a greater variety of planes." The club's last meet was a hit with contestants and spectators alike. First went to Bob Hill with his neat Buhl Pup. Maybe you are right Bob, but it sure looks like Hill and his Buhl pup should be handicapped down to the level of the P-40 et al. . . .

► Sig Manufacturing, who cuts some of the wood used by modelers who do so make airplanes, already has outgrown a year-old building and plans an addition this coming summer to double the floor space.

"In spite of the constant moaning about over-simplified kits, ready-to-fly, plastics, etc.," remarks proprietor Glen Sigafosse, "I believe there is more serious model building today than ever before, and I've built models since 1929. We owe a lot of our success to the plans you publish. Many retail sales are for balsa to build these planes."

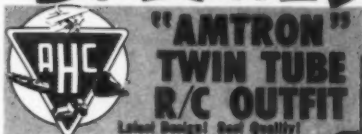
► Speaking of the Nats, 1957 we mean, it's to be Willow Grove, Pa., July 29 through August 2. More than 400 trophies and awards. So you'll have one chance in three to win an award. Sounds like television. . . . Stewart Lundahl has a new spray gun at the hobby shops. Works off a vacuum cleaner or other air supply, any type of paint, lacquer, dope, etc. Called the 410M Hobby Spray Gun. . . . And have

you seen the Jetco Sabre Stunt? This is definitely one of the best—let's say there is none better. The Jetco firm is operated by Christine and Albin Zaic, with an assist from Bill Dean, he of the fifty plans, on over-all kit design and plans. Designed and built by Jose Sadurni, Mexico, the model took second at the 1955 California Nats. Mexican models in general are works of art and Sadurni's was considered the best looker in stunt at the big meet that year. It's a big job, 50 inches span, for .19 to .35's. To judge by the plans and the many detail sketches, the structural engineering that went into the kit, must have required months of skull-cracking work. This Sabre is a stand-out job.

► Should the U.S. send teams, or models to be proxy flown, to all international events? The reason for the disastrous and disgraceful showing in speed at Florence, Italy, has been blamed on the lack of top-notch supplies at the bases where the AMA members in the armed services in Europe were stationed. Much has been said about the lack of support, money that is, to transport our teams to the various final sites. Heck, we can't even find supplies for our representatives! If the supply situation was so bad that only one official flight was turned in, a 92 mph for a 28th place, we certainly had no right cluttering up the premises at Florence. Doubt that any other country in the world would have managed so poorly. Nor does this column believe that the Italian proxy fliers could be the sole blame ("lack of familiarity") for the tail-end performance in Nordic. Given half a chance, proxy fliers at these events have proved themselves well skilled and there is nothing mysterious (to put it kindly) about the Nordics we build. MAN at Work would welcome a frank criticism from the Italians. There's something rotten in Denmark—or in Florence.

► Flying sites come and go and you never know where you'll find one. Last summer the Republic Aviation Model Society, the RAMS, that is, ran two very successful contests at Mitchell Air Force Base, on Long Island. So Art Wardell, who believes you cannot shoot a man for trying, asked the Commanding Officer to set aside an area for controlline flying. To quote Art, " . . . was completely overwhelmed when . . . gave unqualified approval, assigned an officer to handle the details and asked that I set up necessary rules of conduct along with a complete list of clubs interested in using the area and a schedule of flying hours. Now the RAMS ask that all interested parties contact Wardell, the RAMS, in care of Republic Aviation, Farmingdale, L.I. . . . direct approach pays off, as another New York area incident proves. Energetic gent, name of Jack Siegel, wrote Mayor Wagner, explaining the lack of flying sites, how modeling combats delinquency, etc. Mayor Wagner obviously does not own the traditional open-top filing cabinet, because he contacted the Executive Officer of the Park Department who wrote Siegel as follows: "A new area has been designated as of this Saturday, December 1, in the Bronx . . . can be reached by IRT subway, Pelham Bay Station . . . it is north of the Huntington Estate and Kane Parking Field." The rest seems to be up to the modeler. . . . Vision, a \$5 book, authored by Boeing's Harold Mansfield, published by Duell, Sloan and Pearce, 124 East 30 Street, N.Y.C., is an intimate, colorful history of the company, its many airplanes from WW I to this day, and a valuable insight into early American aviation.

RADIO CONTROL SPECIALS



"AMTRON" TWIN TUBE R/C OUTFIT
Latest Design! Best Quality!

TRANS. - RECVR. - ESCAP. TUBES - RELAY - CRYSTAL
EVERYTHING WITH METAL CASE

FOR ALL MODELS . . . BOATS, CARS, PLANES
FROM 1/4 TO THE VERY LARGEST

America's Hobby Center SCOPES 'Em All! We dare you to find an R/C bargain like this anywhere in the world! It's a 27½ mc. free band unit. No operators license required. Range 1 - 1½ miles. Rugged. Safe. Economical performance. No other set—regardless of cost—it more complete! All new, latest design equipment. No Surplus! No Junk Parts! Made special for us . . . to the most rigid specifications. Outfit is self-prefabricated . . . really simple to assemble. Ideal for beginners. . . . yet advanced R/C men will find this an ideal unit.

FULLY GUARANTEED \$39.95 VALUE

HERE'S WHAT YOU GET:
Transmitter, complete with tube, crystal and telescoping antenna;
Twin-Tube Receiver, with relay and tubes; assembled self-neutralizing escapement; Super sensitive contact relay; Dust Core Tuner. Complete installation kit; Easy-to-follow, step by step instructions for assembly and R/C Manual. You get EVERYTHING you need to operate . . . complete, except for batteries.

MONEY BACK GUARANTEE INCLUDED!

LOOK! MORE R/C BARGAINS

Everything carries the famous AHC Money-Back Guarantee!

Field Strength Motor 995
A real hot! Complete! Wind, adjusted and Ready-to-Operate. In plastic case.

"AMTRON" 4 POSITION ESCAPEMENT. 1½ to 3 Volt. The Very Finest Made. An AHC Super Value at only \$4.95

TRANSMITTER KIT with tube, crystal & telescoping antenna. Complete, less batteries. \$12.95

TRANSMITTER ASSEMBLED. Prehuned, ready to operate. Less batteries. \$18.95

RECEIVER KIT. Complete with tubes & relay. Less batteries. \$9.95

RECEIVER ASSEMBLED. Prehuned, ready to operate. Less batteries. \$12.95

CRYSTAL 27½ MC. 3.95
INSTALLATION KIT. 1.95

2 POSITION ESCAP. "Amtron." Very Finest Made. A Bargain! 94.95

MORE R/C EQUIPMENT

Order from this listing . . . or anything advertised . . . from AHC	
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 8.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 10.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 12.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 14.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 16.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 18.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 20.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 22.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 24.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 26.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 28.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 30.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 32.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 34.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 36.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 38.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 40.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 42.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 44.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 46.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 48.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 50.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 52.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 54.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 56.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 58.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 60.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 62.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 64.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 66.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 68.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 70.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 72.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 74.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 76.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 78.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 80.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 82.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 84.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 86.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 88.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 90.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 92.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 94.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 96.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 98.95
Super Aerial "Ready to Operate" Escapement, 1½ to 3 Volt. \$4.95	Super Cascade Var/Cont. 100.95

ATTENTION ALL R/C FANS!
FREE AHC "BARGAIN-BULLETIN!"
Ask for Bulletin "BCB". Lists many, many big bargains. Send a self-addressed, stamped envelope for your FREE copy.

SEE NEXT PAGE FOR MORE AHC BARGAINS & HANDY ORDER BLANK

America's Hobby Center, 148 W. 22nd St., N. Y. 11, N. Y.



Budapest, in 1956, was site of the Internationals, attended by this Russian team competing in Nordic, Wakefield; FAI Speed, Free Flight.



Fifth place 1956 Wakefield to Russia's Smirnov. Model resembled Western jobs more closely than other Soviet Ships. Model Aircraft pic.

Three Russians, of a four-man team, placed in first nine in last Wakefield. Model Aircraft (London) picture shows Smirnov winding.



how Good are the Russians?

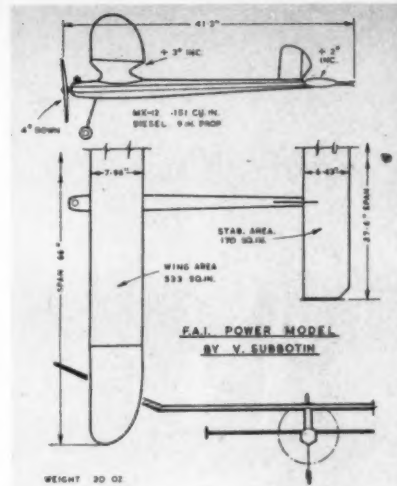
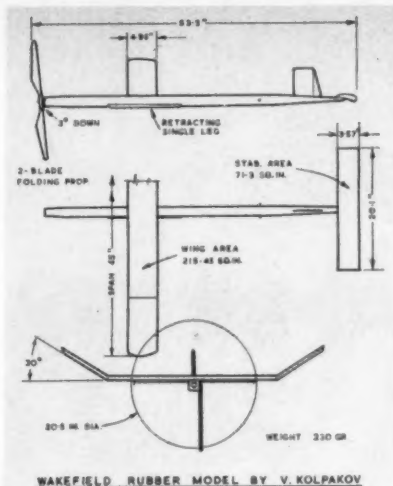
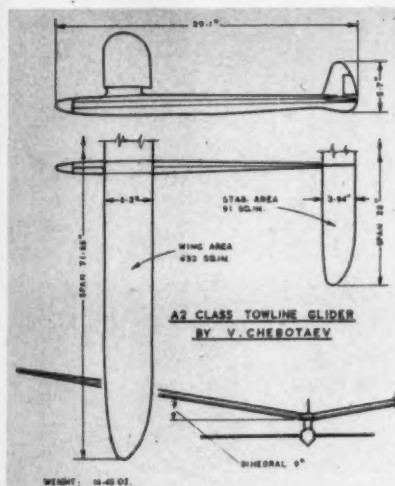
by P. G. F. CHINN

In 1956 Russia competed against the West for first time. And here, for the first time, is the low-down on Soviet modeling and design trends. It's a serious "hobby."

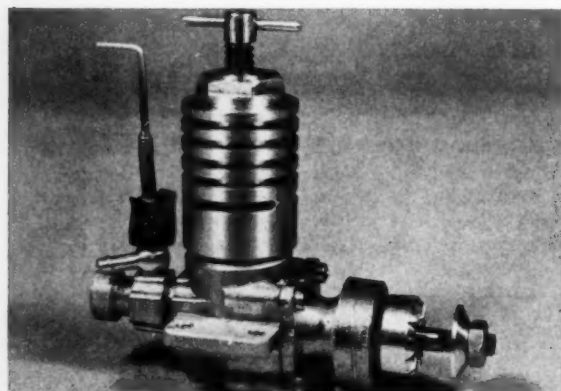
► The scene: the 1956 Wakefield International Contest at Hoganas, Sweden, where eighteen nations have just competed for the World Championship. The individual winner: a Swede, followed by an American, with a Briton and a Dane tying for third place. In the fifth place, out of fifty-eight contestants: a Russian. But, more impressive, three Russians, of the four-man team, are among the first nine place winners.

And so, competing with the West for the first time in an international model airplane contest, the Soviet Union becomes runner-up to Sweden for the Team Championship, narrowly beating Great Britain and the United States into third and fourth places respectively.

The high placing of the Russians was probably a surprise to some people, but not necessarily to anyone who remembers the past three seasons' Soviet Internationals, as reported in our Foreign Notes column. These meetings, held in Russia in 1954, Czechoslovakia in 1955 and Hungary in 1956, have clearly indicated the high standards of modeling that exists among (Continued on next page)



Leading Russian rubber exponent, Vladimir Matvejev. Built largely from reed, models take months to construct. Pic by Model Aircraft.

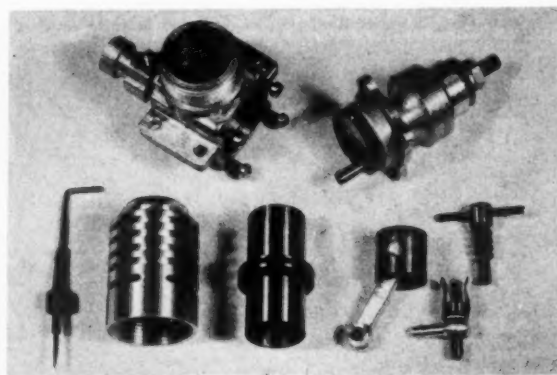


Standard FAI class motor, by MK-12 Diesel, designed by Gajevsky. It lacked "steam" when tested against western types at higher rpm's.

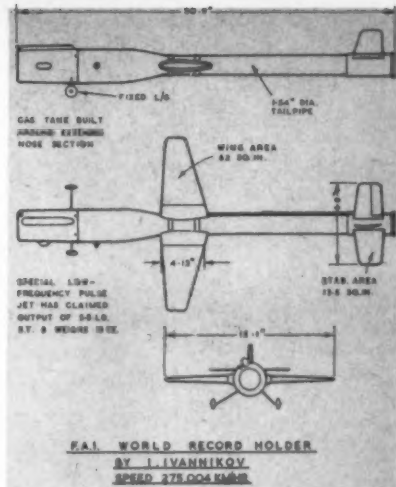
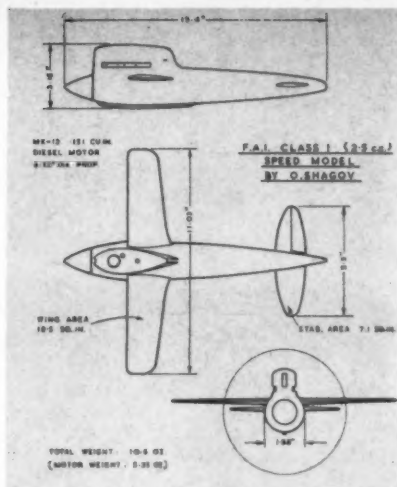
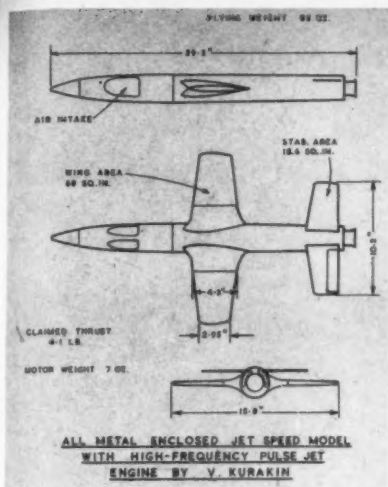
the experts in these Communist countries and, in particular, the strength of the Russian Wakefield flyers. This is underlined by the fact that the leading Russian Wakefield flyer, Vladimir Matvejev, sole representative of Russia in these three contests, placed 2nd. in 1954, 1st. in 1955 and 2nd. in 1956. That he is no exception, however, was proved when his three compatriots, Smirnov, Ivannikov and Kolpakov, placed fifth, eighth and ninth, ahead of Matvejev, in Sweden.

It is well-known that the Soviet Union holds a large number of official model airplane records. Even under the newly revised schedule of International classes, ten records, including three absolute world records, are held by Russia at this writing. Many of these records are for distance and height, categories which Western modelers seldom bother about, due to the practical difficulties attending the recording of such flights. Russia, however, regards these records as being sufficiently important to warrant official assistance by the provision of full-size aircraft for the necessary escort and chasing duties.

Here, in fact, we do begin to see the essential differences between East and West in modeling matters. In the United States, Britain, Germany, for example, the modeling movement is a hobby, supporting a commercialized industry which, in return, provides a vast selection of high-quality, low-priced model equipment and materials that can be purchased over the counter by anyone. It gets



Parts of the MK-12. Engine features twin ball-bearings and rear disk valve, but does not have precision and finish of some motors.



no support from State sources and asks for none.

In Russia, things are different. There is virtually no model industry as we know it. The movement is in the hands of officially sponsored modeling "institutes." Here, the youngsters are trained in the rudiments of model aircraft construction, progressing, by stages, to more advanced models. Later, they may have the privilege of representing their locality in national contests and eventually, perhaps, of flying for the U.S.S.R. in an international event. When this occurs, they will wear the dark jersey and slacks uniform of the Soviet "sportsman" or "sports-woman," with the Russian characters "СССР" (SSSR) in large white letters across the chest—a get-up which is becoming increasingly familiar at international athletics events throughout the world.

For events of this nature, the Russians spare no expense. When contestants from the satellite countries were invited to Moscow for the 1954 Soviet Internationals, everything was done, not only to make the contest itself a success, but also to favorably impress the visitors with the Soviet way of life.

Thus, on arrival in Russian IL-12 transports at Moscow 3-4 days before the actual contest, parties were first taken on a tour of the city and shown some of the brighter aspects of Soviet achievement, the 800-ft high university building, the 100-yard wide city streets, then driven to their "lodgings"—some sort of castle of Czarist days and now a rest-center for "workers." Here, we are reliably informed, the feast laid before them was of such gigantic proportions that, when time came to hit the hay, the stairs were navigated on all fours.

At the contest site on Tushino Airport, contestants were provided with field repair boxes, "pits" where engines could be tested, plus the services of a team of Russian experts who, quote, "helped and advised the foreigners in a comradeful manner." The organization of the contest, we were told, was excellent. No models were lost: if a model passed out of the airfield, a Very light was fired and a Yak 18 two-place trainer, or a helicopter, at once took off and pursued it to its landing point.

The remarkable thing about the annual Soviet Internationals is that all these preparations are for the benefit of 35-40 contestants who, between them, return no more than a maximum of 120 flights in all the free-flight categories and somewhere between 20 and 30 flights in the control-line classes. Yet, at Moscow, a whole week was occupied in running off these events and the complete program, including process-

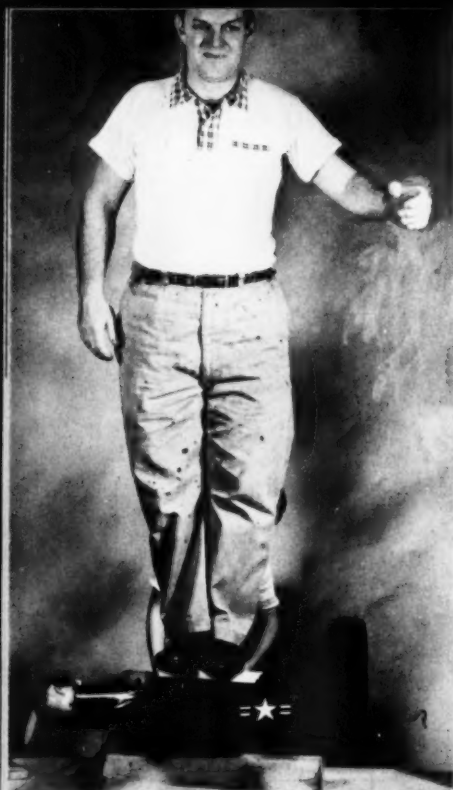
(Continued on page 38)



Kolpakov winds last few turns on his 9th place Wakefield. Model had long fuselage, parasol wing, complicated geodetic frame. MA photo.



World's fastest model airplane (FAI Official) and the builder, Ivan Ivannikov, who took an 8th in Wakefield. Jet job turned 170.8 mph.



Can you do this to your model? Better than a wood job, author's Grumman Guardian "solid."

by GEORGE MOIR

It would be a crime to let pass unnoticed this revolutionary new way to build an airplane stronger, lighter, faster. Check supply sources at the end of the article.



Looks the same but what a difference! Styrofoam blocks are carved and sanded easily.

Guardian in Styrofoam

► Navy Carrier Event planes have come into their own. In the 1956 Mirror Meet, there were 64 such entries. With the wonderful help of the Navy, this event has become popular for both contestants and spectators. It taxes the skill of the pilot and is a challenge to the builder.

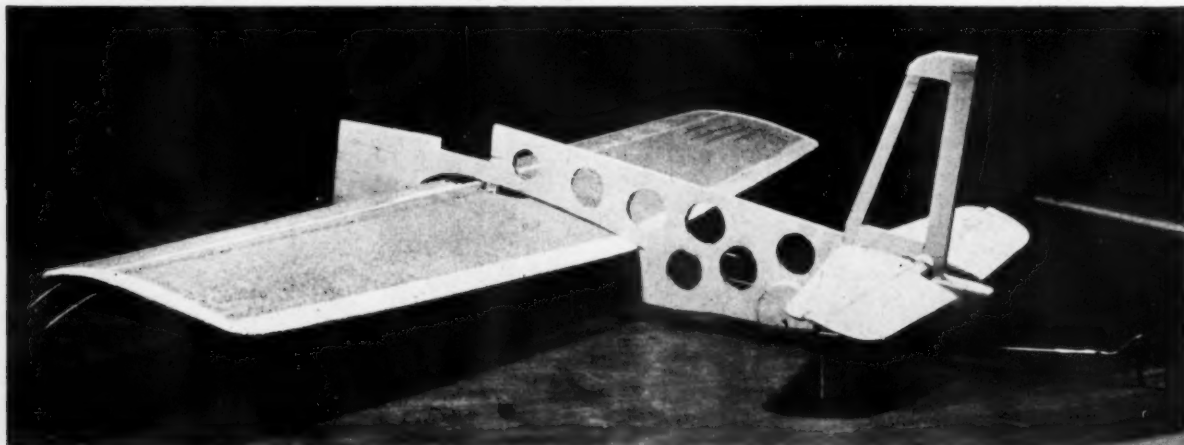
With the builder's problems in mind, our Guardian was designed to use Styrofoam as the main structural material. Styrofoam construction is much easier, lighter, and stronger than the conventional method of making up formers, wing ribs, plus heavy planking, etc.

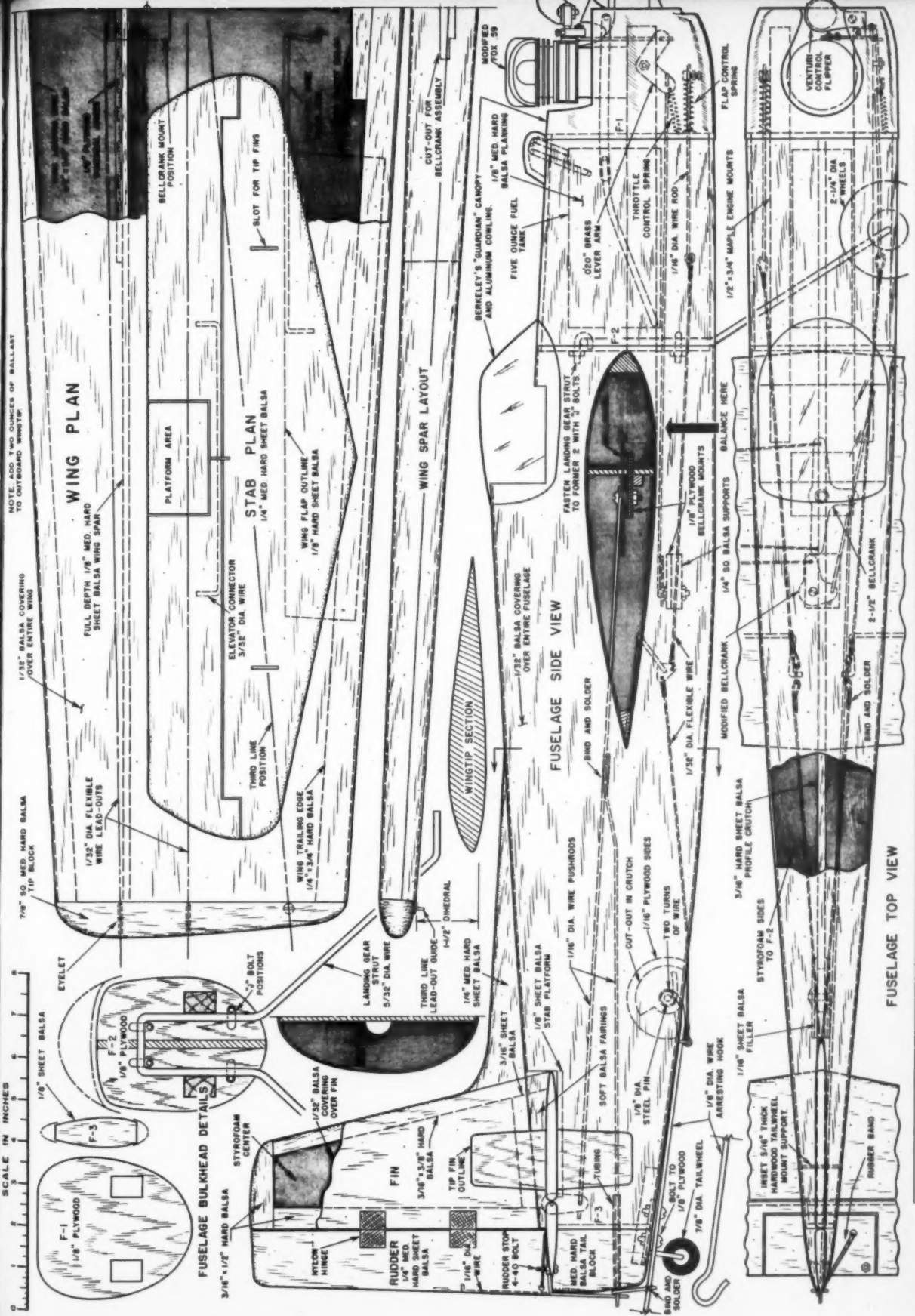
This model has automatic flaps that

fold up in place when the arrester hook makes contact with the arrester rope. This eliminates nicked flaps; also, the rudder goes into hard-right position when the hook is lowered. This helps to keep plane taut on lines during slow-speed flight. The motor control is on a third line and can be worked independently, which means the plane can be slowed down before dropping the hook and flaps.

There are no wing ribs in the main wing, only the main spar, leading and trailing edges, with a 1/32 balsa sheeting covering the Styrofoam. The fuselage has only (Continued on page 45)

And here, the Styrofoam has been attached to the wing spar, edges, and shaped. Side blocks will cement to the keel, fin, same way.





FULL SIZE PLANS AVAILABLE. SEE PAGE 56.



Flight line at recent Northwest Championships, Seattle, included Constellation with four Half A's, Douglas mail plane, Jap Zero.

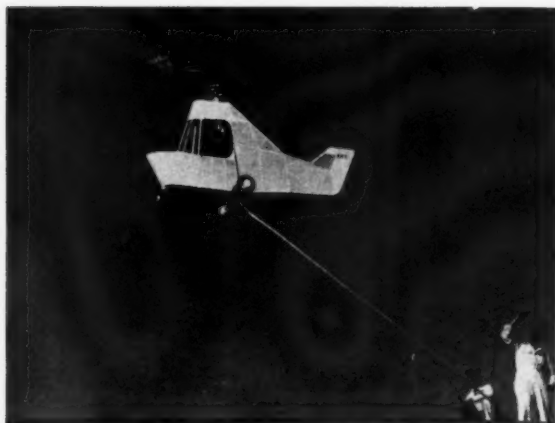
AIR WAYS

Hard to believe that these beautiful reader-built craft were created by people who were once beginners. Really dream crates.

Outstanding geodetic glider bettered 20 minutes at recent British RAF contest. Clever canard, or tail-firster, designed by G. Copie.



FOR nearly 30 years now, Air Ways has been the traditional title under which MAN has presented pictures of model planes made by its readers. Easy-going features like this too frequently get squeezed out by the serious business of building and keeping up with the mob. So, let's just enjoy these nifty planes.

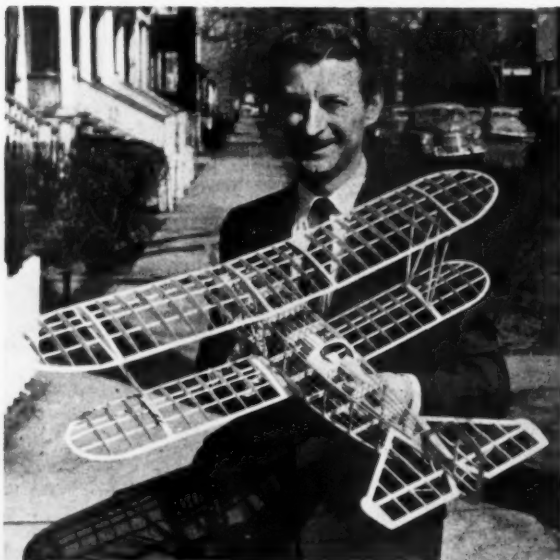


When helicopter designer Igor Bensen wanted to test design he made compressed-air power model. Has remote stick control, maneuvers.



Hard to say whether Robert Haack, San Antonio, is a better modeler than he is a photographer. Sterling pic of a wonderful F4B-4.

Many years a well known scale fan, Bill Gough, Chicago, made this 33 in. Boeing 95 mail plane. Weighs 6 ozs. and flies on Cub .035.



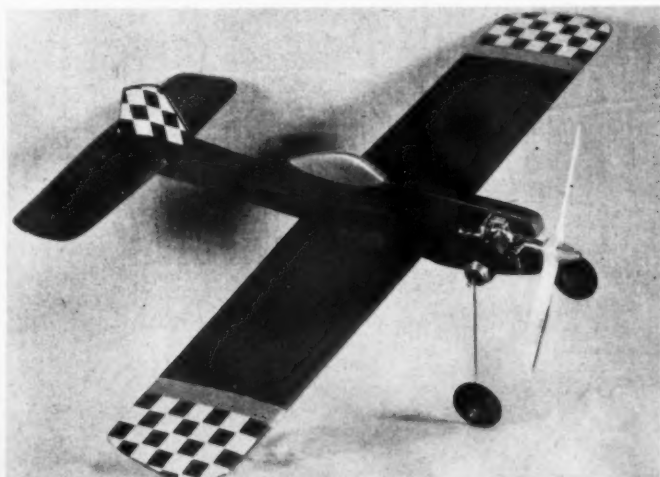


Hot trio of stunt ships from MAN plans, by Ward Trulock and his dad, from Odessa, Texas. Shown are Nobody, Half Fast, Palmer's Mars.



Keen looking Nieuport 28, WW I fighter, a tribute to building skill of Carl Miller, Nashville (Tenn.) Hobby Shop. He builds them all.

Third model he built and the first to fly, was this Scorpion, MAN Oct. 1955, by Bill Hudson, Norfolk, Va. Cub .049B, 25 ft. lines.

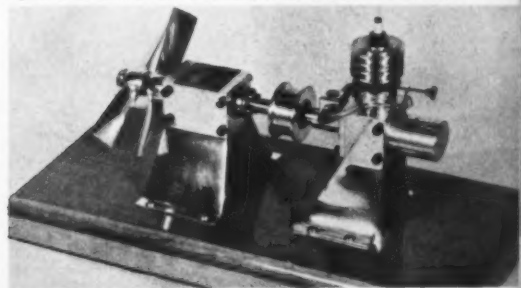


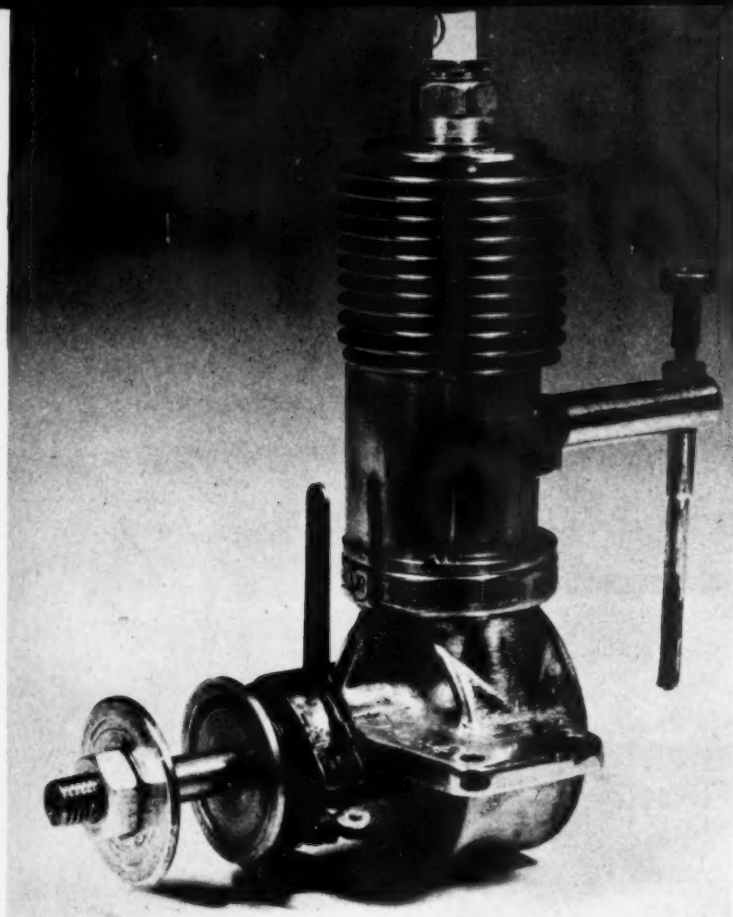
Be prepared, says Richard Paul, Brooklyn, N.Y., posing his .06, .09, and .15 Space Tigers. Functional craft.



Most authentic model in many a moon, a super-detailed Nieuport 11, by G. William Johnson of Jamestown, N.Y.

Magnificent job on Lil Dragon engine from MAN plans, by Fred Glenn, in Bel Air, Md., school. Shot the works.



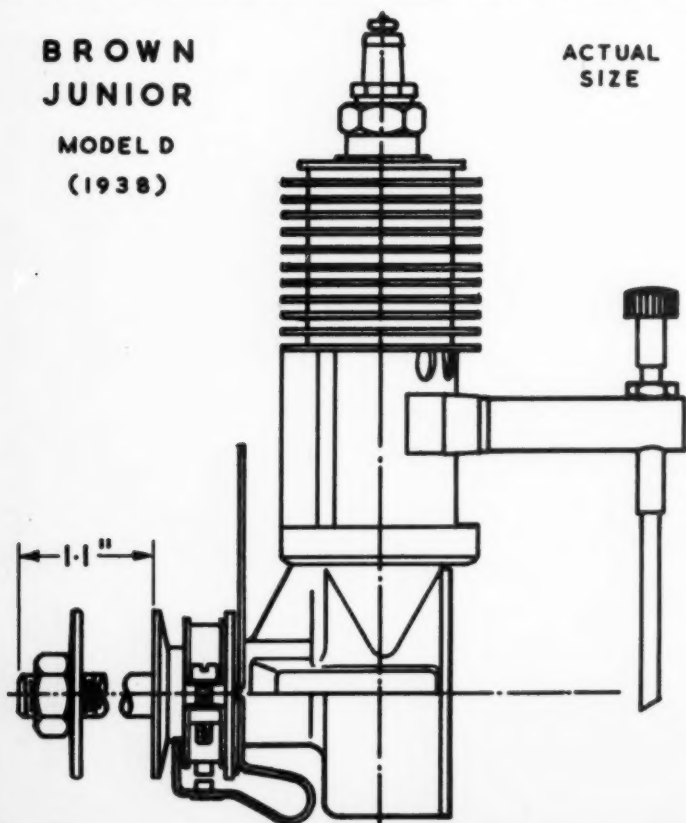


It looked like a stove pipe but oh how it ran! Brown designed his own plug. Hurler shown.

BROWN JUNIOR

MODEL D
(1938)

ACTUAL
SIZE



Bill Brown's Brainchild

by P. G. F. CHINN

*The "original" gas engine,
of 20 years ago, put pow-
ered models on the map. In
a way, the Brown was as fa-
mous as Henry Ford's flivver.*



► The Brown Junior engine, famed in pre-war years, can justly claim to be the "original" model airplane engine.

During 1932 and 1933 a Philadelphia model builder, Maxwell Bassett, entered several model contests, using a large model powered by a miniature gasoline engine built by William Brown of the same city. At this time, of course, the form of motive power especially employed for duration models was the strip rubber motor and so decisively did Bassett's model demonstrate its superiority over rubber powered models, winning the Stout, Mulvihill and Moffett trophies at the 1933 Nationals, that a separate class for engine driven models was forthwith introduced.

In 1934, the Brown Junior engine was established as the first miniature internal-combustion engine for models to be offered for general sale to the public. The company formed for its manufacture was called the Junior Motors Corporation and in the next five years about 50,000 Brown engines were made.

Basically, the Brown Jr. remained unaltered through its many years of production. Even in 1938-39, when other manufacturers were advertising more modern designs, the standard Brown layout was maintained. The Brown had a reputation for quality and reliability and this was, no doubt, responsible for the continued preference shown for it

by a large number of modelers.

The Brown Junior was, of course, a spark ignition two-cycle motor running on a mixture of ordinary gasoline and \$70 motor oil; had a cylinder bore of $\frac{1}{2}$ in. and a stroke of 1 in., giving a displacement of .601 cu. in. For its size it was extremely light, the complete engine, less fuel tank and ignition coil, weighing only 7½ oz.

The whole design was essentially a simple one. A diecast aluminum-silicon crankcase with bronze bushed main bearing was used. Two screw threads only (cylinder to crankcase, and crankcase rear cover) served to unite the complete engine. An all-steel cylinder was employed with integral head and cooling fins and brazed-on bypass passage and induction pipe. The ignition-timer was of an effective, but simple, design and featured an eccentric bush type mounting to facilitate adjustment of the points gap.

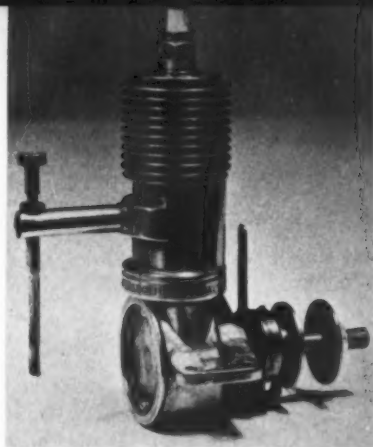
The original production model Brown Junior had a lapped alloy-steel piston and later became known as the Model B. Its selling price of \$21.50 remained unchanged throughout the period of its manufacture, but to compete with other makers offering cheaper engines, two lower-priced models were introduced.

The first of these, in 1937, was the Model C, priced at \$17.50, which was joined, the following year, by the Model D selling at only \$10.00 complete

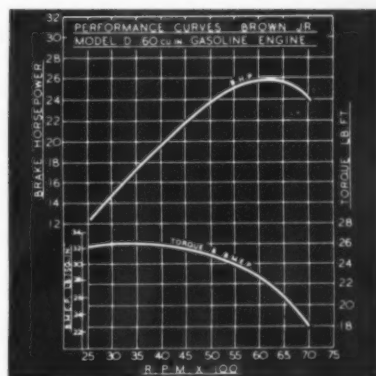
with tank, coil and condenser. Both these engines had aluminum pistons with two compression rings and a simplified carburetor in which the choke control was omitted. In addition, in the model D, a forged alloy connecting rod replaced the steel rod of the earlier models. Finally, in April 1939, all three models were given a minor face-lifting which included an improved contact-breaker and a new transparent fuel tank.

Modelers of pre-war years remember the Brown with affection. From them, from time to time, we hear regrets that the post war generation of model builders knows so little about the delights of the Brown Junior or of the fascination (and frustration) of the spark-ignition era in general. And, in fact, it is interesting to re-examine the Brown in the light of modern developments, comparing essential points of difference in respect of both design and performance.

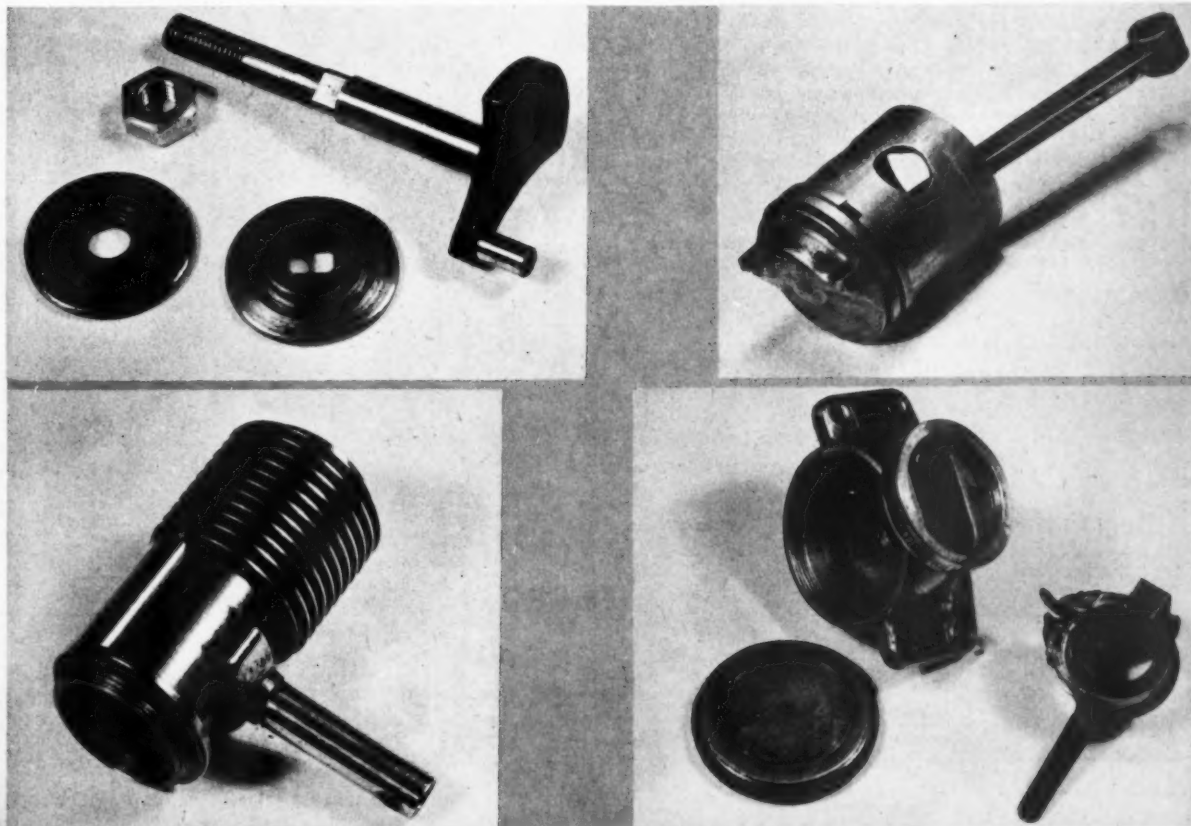
Being fortunate enough to possess a 1938 Model D, still in good condition, we have taken the opportunity of putting this engine through a regular test procedure, including a dynamometer check on output. The engine is actually one of the early Model D's, as first introduced in March 1938. These had shafts of steel not considered to be up to the usual standards of Brown quality and the later, im- (Continued on page 58)



Old maybe, but swung a club without overheat. Below—in 1930's this was really performance!



Brown Model D parts make interesting comparison with 1957 productions. Modestly proportioned shaft, tiny wrist pin, then adequate.







The designer's original airplane—5½ pounds of rugged, functional flying machine. Five-channel control by a CG transistorized receiver.

the Smog Hog

by R. E. BOWEN

► The Smog Hog was the winner of the multi-class in the 1956 Nationals radio control event, and the California State Meet with a high score of 202 points. The design is the result of many months of designing and flight testing by Howard Bonner. The primary objective of the Smog Hog design was ease in building, low maintenance, ability to perform all the maneuvers required and still have a light enough wing loading for doing these maneuvers tighter and quicker without excessive losses of altitude. The airplane is simple enough for the beginner, but still lets the expert add his little changes. As the design stands now, it is a top notch contest performer. Although a C.G. 5-channel receiver and the new Bonner servos were used for the winning flights at the NATS, it has gone through a full stunt pattern (inside and outside loops too) with a single channel Deltron receiver and Bonner's Vari Comps cascaded. This single-channel version won the "Mickey Mouse" Class of a recent LARK'S contest.

The Smog Hog is a fully stunnable radio controlled model with hands-off recovery. This means you can relax when out for week-end pleas- (Continued on next page)



Howard Bonner putting the Smog Hog through it's paces. Note that smile of satisfaction. Light wing loading eases abrupt maneuvers.

Light weight and simple lines distinguish most really good multi jobs. For aerodynamicists, the wing uses a 2415 airfoil section.



Sensation of the radio event at the last Nationals was this great multi-channel winner. Outstanding are light weight, simple construction, terrific stunt ability.

ure flying, or you can wring it out in competition. If you should ever become confused (and who hasn't) or get too excited during a maneuver, returning all controls to neutral will let the airplane recover itself.

The size of the fuselage cabin permits the installation of any receiver on the market today with plenty of room left for batteries, servos or escapements, and your hands. The latest ideas for a practical, easily maintained model have been used, such as a two-wheel knock-off type landing gear, an expandable engine mounting plate that permits quick engine changes in the field, or it will break before damaging the engine and fuselage in a crack-up. Another unusual idea is a visual fuel supply in a crash-proof 4 oz. plastic squeeze bottle (holds Willhold Glue) that has been modified to function as a "clunk" tank. The tank is mounted outside the fuselage aft of the engine, where it can be easily removed for cleaning, and is held on with rubber bands.

Since construction details are clearly shown on the plans, it is not necessary to go into a detailed construction discussion. However, highlighting a few points will enable the less experienced modeler to duplicate this fine model and it's superb flight characteristics.

FUSELAGE—The fuselage is the conventional strong box-type with sheet-balsa sides, top, and bottom. Side up-rights help prevent the sunken appearance so prevalent on slab sided models. The windshield and side windows are not cut out, but are painted on to increase the strength of the cabin area. The flat windshield helps give some of the drag necessary to get a lower power-on and power-off speed differential. Parallel fuselage sides aid in squaring up the fuselage during the initial stages of fuselage assembly. Careful alinement of the nose blocks is necessary to result in the 0 degree thrust line and the fit of the firewall (F-1).

Before planking the top and bottom aft of F-3, install and line up the push rods (servos) or torque rods (Vari Comps) and make sure they operate freely without any binds. A little time spent now on the torque rods (if escapements are used) will prevent a locked control surface later. Use blind nuts to mount the Vari Comps on a bulkhead 1" ahead of F-3. The escapements should be mounted temporarily to check line-up of the torque rods, then removed, wired and installed when the fuselage is completed.

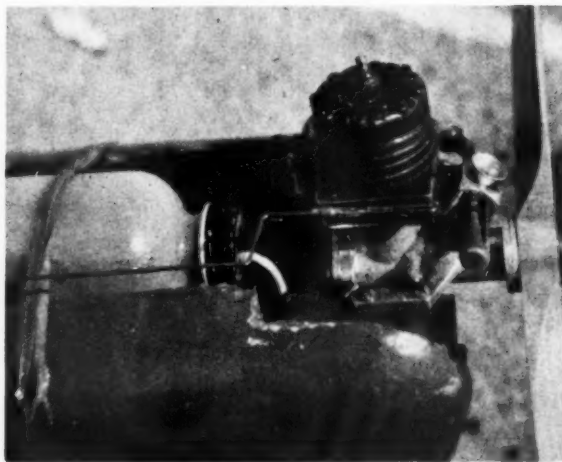
Cover the fuselage with nylon and dope. If additional strength is desired, the fuselage can be fibre-glassed on the lower side back to F-3. Make the fuel tank tray fit snugly over the battery compartment. Be sure to fuel-proof the nose and battery compartment thoroughly. Add steerable tailwheel bracket and cement firmly.

Install batteries required for your receiver in the battery compartment between F-1 and F-2 and pack any spare space left with plastic sponge to prevent vibration and impact damage. Vibration can work a well soldered joint until it breaks. Put a thick pad of plastic foam against F-2 and mount the receiver vertically against it, if any other receiver than the "CG" 5-channel receiver is used. Mounting of the "CG" receiver is shown on the plans. Note that the receiver is mounted high on F-2 to keep the center of gravity high and to provide accessibility. Follow the manufacturer's instructions on installing and wiring your receiver. If servos are being used, mount the rudder and elevator servo on the servo mounting board which is screwed to the servo rails. Wire servos to the receiver as per the wiring diagram supplied with the servos and receiver. Drill any necessary holes for switches and test jacks. Mounting the engine off center as shown on the plans will give straight flight with full throttle.

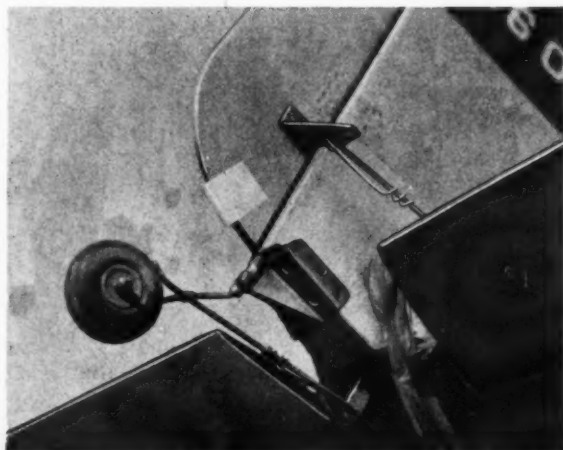
A Bramco throttle is used on the engine and is operated by a Bonner SN escapement that gives two speeds. The escapement is mounted on the (Continued on page 55)



Preflight checking before every hop saves airplane and ensures top performance. Knock-off gear is a great repair eliminator, too.



Complete accessibility of engine and fuel tank leaves nothing to be desired. Fuel level visible in squeeze bottle used for a tank.



For ground maneuvers, up-elevator applies a brake to the steerable tail wheel. Details shown on the plans—compare with this photo.

FIGURE ONE

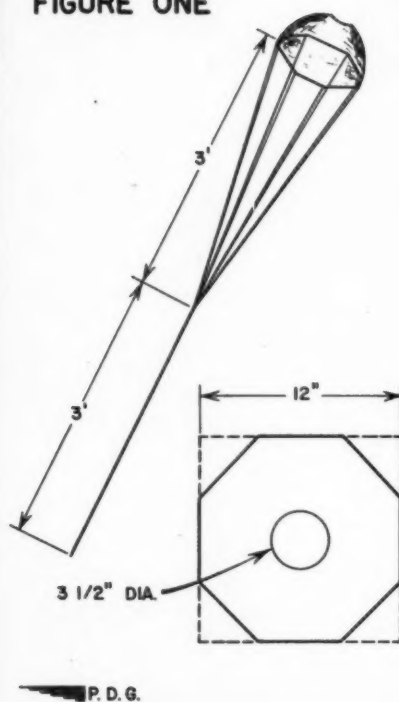


FIGURE TWO

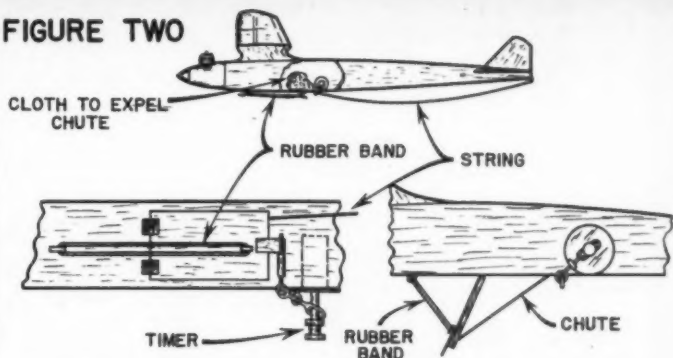
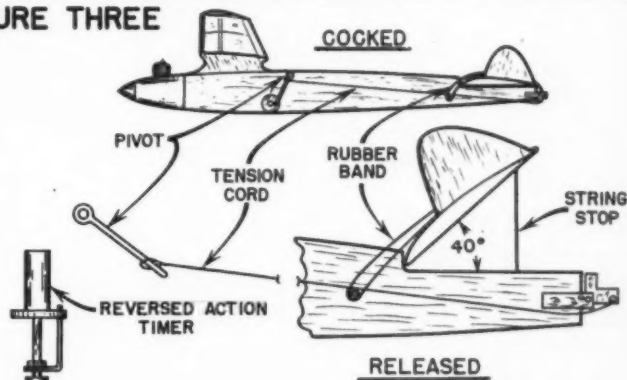


FIGURE THREE



These work! Figure 1—Properly designed chute. Four-sided won't work, more than eight lines unnecessary. Modeling silk too light.

Figure 2—Recommended set-up for chute-type dethermalizer. And, Figure 3, old reliable pop-up tail. There are tricks here, too.

These Blankety Blank Dethermalizers

From tame eagle to 12-gauge shot guns, the man has tried them all. A complete survey of what will, or won't, work!

by **DONALD K. FOOTE**

► When a newcomer gets an idea and goes to the trouble of building an airplane to test his idea, then smashes a good airplane because of it, he often curses all blankety-blank dethermalizers and becomes a dethermalizer hater from then on.

The chances are that this same experiment had been tried before, and if the newcomer had only known about it he could have avoided a lot of grief with an unworkable idea, and instead he could have spent his time improving some workable device that had been developed over a long period of time by many fliers.

There have been many ingenious attempts to design dethermalizers. Some of them work and some of them don't. But, once a modeler experiences the thrill of watching his ship break out of a thermal and return to earth so that he can get his remaining flights in, and not have to return home minus his pretty airplane, he is a dethermalizer (or DT) fan from then on.

A DT makes it possible for a flyer to win a contest

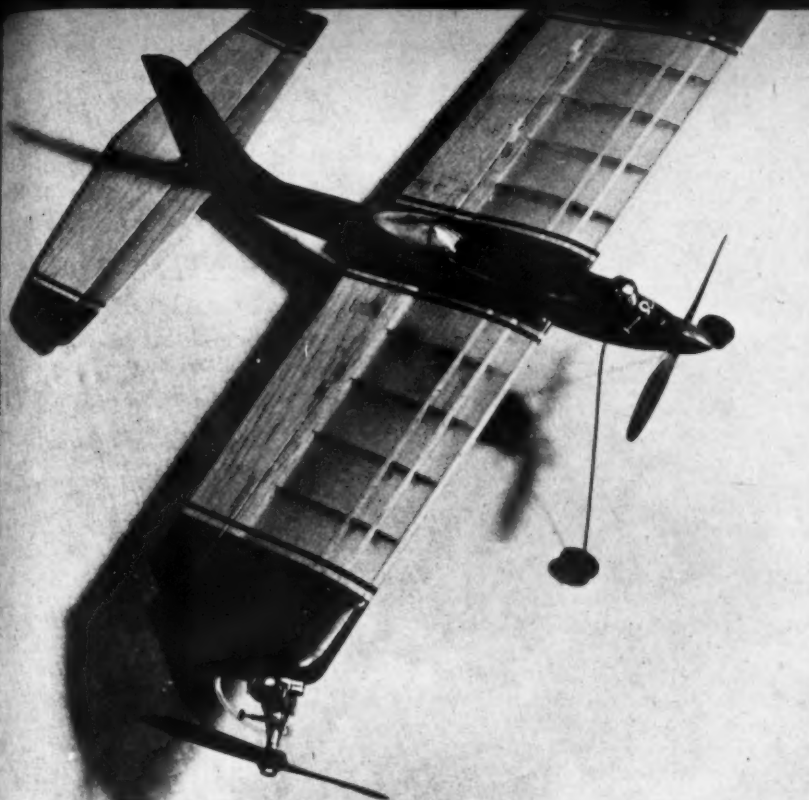
without the danger of losing his ship. While it still allows the flier the thrill of catching a thermal, it gives him the additional thrill of seeing his ship drop out of a powerful updraft before heading for parts unknown.

There is need, therefore, not only to describe some DT's that work, but also to describe the difficulties and shortcomings of some DT's, so that experimentors will not go on repeating the same mistakes of others.

Let me emphasize that this is not a theoretical treatise. It is the result of over ten year's experience with DT's. The first time that I used a DT in an AMA contest, in 1940, decision of the contest officials was held up until a ruling came from AMA headquarters on the legality of my flights. It was claimed that I was using a parachute to hold my ship up! Many, many ships have been lost and smashed up in order to obtain the information contained in this article.

Full-scale gliders use spoilers on the wings to increase their sinking speed, so it was logical, when DT's were first thought of, to try spoilers on models. A spoiler is simply a flat surface which (Continued on page 49)





Anyway you look at it, it's a sure show stopper. Almost looks like the free flight in action.

by CARL RISTEEN

Out of this world maneuvers on 200-foot lines possible on Half A engines! Picture it on Mono-Line, if you can.

Light construction, wing flaps and big flippers, coupled with that outward-pulling tip engine makes feasible towering eights and overhead maneuvering hitherto impossible. Avoid power lines.

Strato-Liner

► Why fly on long lines? The answer is obvious. With longer lines, much more flying space is available, resulting in immeasurably greater realism and smoothness in maneuvers. But when a regular stunt model is reeled out to fly on very long lines, complications set in. Control response falls off badly, the model develops a floating tendency, and slight winds become a major threat. As a result, the attempt often ends in disaster, and the flier firmly resolves to stick to short lines, and to put up with the disadvantages of poor realism and hurried, jerky maneuvers.

It was a desire to produce a model capable not only of handling extremely long lines, but of flying full pattern stunt, unhampered by a moderate wind, which resulted in the first Strato-Liner.

The theory behind the strange layout was that the engine on the outboard wing should supply a steady thrust, acting directly outwards along the lines, keeping them tight at all times, and supporting the weight of the model in overhead maneuvers.

Accordingly, the first model was set up with the outboard wing engine pointing straight out of the circle.

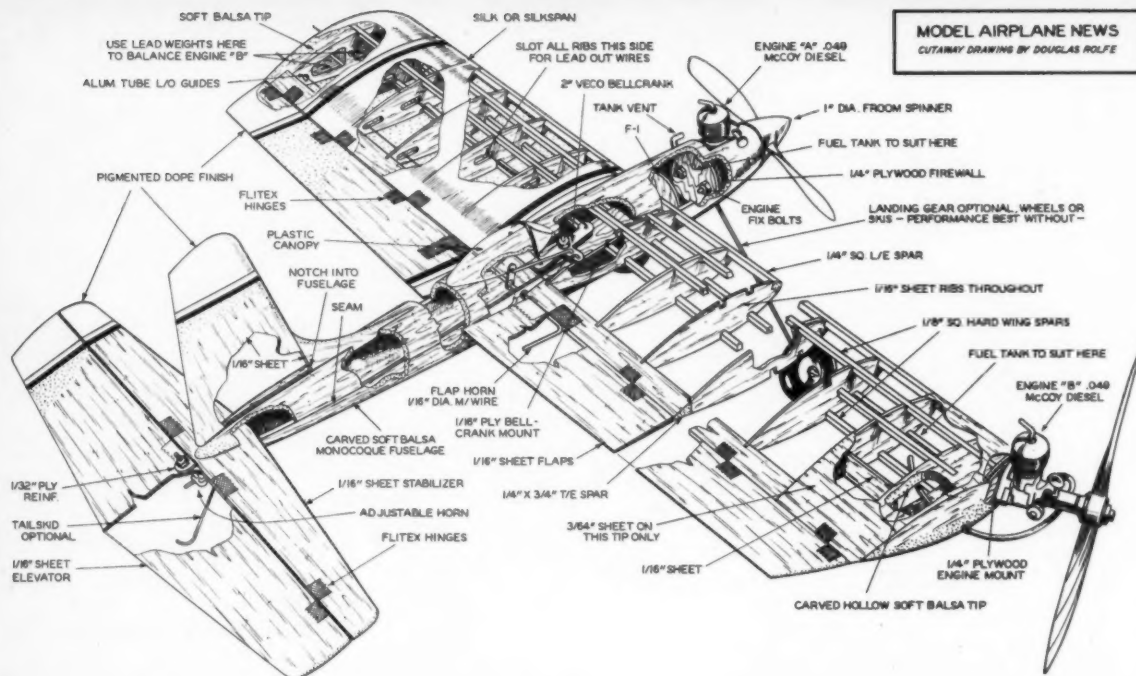
Failure dogged the first attempts at flight, the model slowly sinking to the ground after the launch, with both engines screaming valiantly. Evidently, the drag of the outboard engine was too great, forcing the model into a badly crabbing attitude, in which the outboard engine pulled partly backwards, as well as outwards. Conse-

quently, very little forward speed was possible. The addition of forward thrust to the outboard engine quickly remedied the situation, however, and the model began to really perform, although hampered still by a very severe wing rocking during maneuvers. A lead counterbalance added to the inboard wing tip, cured the wing rocking, and I reeled the model out to successive line lengths of 60, 100, 150, and 200 feet. Performance was very good, with excellent line tension maintained through all maneuvers, even on over 200 feet of line. Despite its weight of over twelve ounces, and its squarish, unstreamlined form, the model flew with surprising speed and maneuverability.

The second model, which is shown on the plans, was built in an attempt to lower the weight, and thus improve line tension in overhead maneuvers. Weight of the model came out at nine ounces. The use of a streamlined fuselage, offering less resistance to the side wind from the outboard engine, greatly improved line tension and handling. The realism of the model in flight is quite uncanny, and its long, screaming dives and huge, sweeping maneuvers are very impressive. The Strato-Liner has enough pep to enter a huge vertical eight immediately after taking off.

But if you want to wow the crowd at your next flying session, you'd better start construction now.

The fuselage is carved in two shells from a piece of medium soft balsa measuring 1 x 2 x 36 in. Trace the



Stratoliner continued

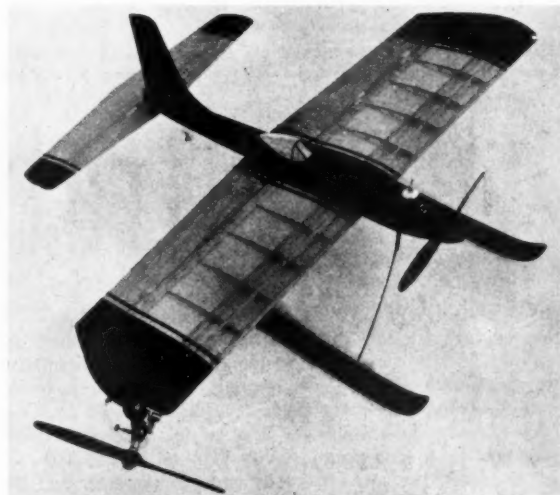
side and top view of each shell on the balsa, and saw to shape. Then round off each shell and hollow out, leaving about $\frac{1}{8}$ in. wall thickness. Cut each shell to fit wing and stab airfoils, cut off the cowl section of the top shell, and cover each shell with silk for strength. Mount the firewall in the lower shell, double cementing, and apply a good fillet of cement, coat by coat. Mount the engine, attach a 1 in. spinner, and trim the lower shell to fit.

Construction of the wing is very simple, except possibly for the outboard wing tip motor mount. The tip is carved to rough shape from medium soft balsa, then rounded and smoothed to fit engine. Then the firewall portion is cut away as shown on plans, and a piece of $\frac{1}{8}$ in. ply substituted. Mount engine on ply, soldering nuts to a piece of tin can stock to hold them permanently in place. The ply firewall is then double cemented to the tip block. Correct setting for the outboard engine is 25 degrees offset from straight out, or 65 degrees from straight ahead. Check alinement of engine very carefully, as any upthrust or downthrust can be very troublesome.

The inboard wing tip counterbalance comes next. It should be just sufficient to balance the outboard engine and propeller. Do not try to skimp on the counterbalance, or wing rocking will be quite severe, making the model almost unmanageable.

Now for the fuel tanks. The simplest type of tank is the balloon tank, made from a small toy balloon. However, if you use Diesels, make sure that your balloons are unaffected by Diesel fuel.

Small clank tanks, although more work, also work very well. These may be soldered up from thin shim stock, or a commercial tank may be modified by the installation of a universal fuel pick-up. This may be made from a piece of small diameter, very thin-walled black neoprene tubing, with a lead weight on the fuel pick-up end. With this pick-up, it is possible to get nearly the last drop of fuel out of the tank, no matter what position the plane may be in. Regardless of what type of tank is used, the outboard wing tank should be made a little



In the snowy Canadian winter, the designer found these skills to be a practical means of taking off and landing. Silk covering shown.

bigger, to insure that the inboard engine always stops first, the outboard engine maintaining line tension for landing.

Install the bellcrank and lead-outs, and cover the entire wing, including the centerpiece. Silk is preferable for its greater strength and low weight. Cover the wing flaps and tail assembly with silk, mount them, and install the control system, making sure of correct elevator and flap travel. Then cement the top shell of the fuselage in place, and add the cockpit canopy and fin. The cowl section is cut to fit closely around engine, and retained by small rubber bands stretched between wire hooks attached internally.

The finish of the model should be of a fairly low weight. The original model sports a clear finish over yellow silk on the wing and tail, red on the fuselage and wing tips, and blue for trim.

(Continued on page 45)

Theory and the Stunt Model



by W. F. NETZEBAND, JR.

**Though ukie ships
rule-of-thumb in
their design, they do
obey aerodynamic
laws. If you were
happy maybe you
had better skip this!
Can you resist?**



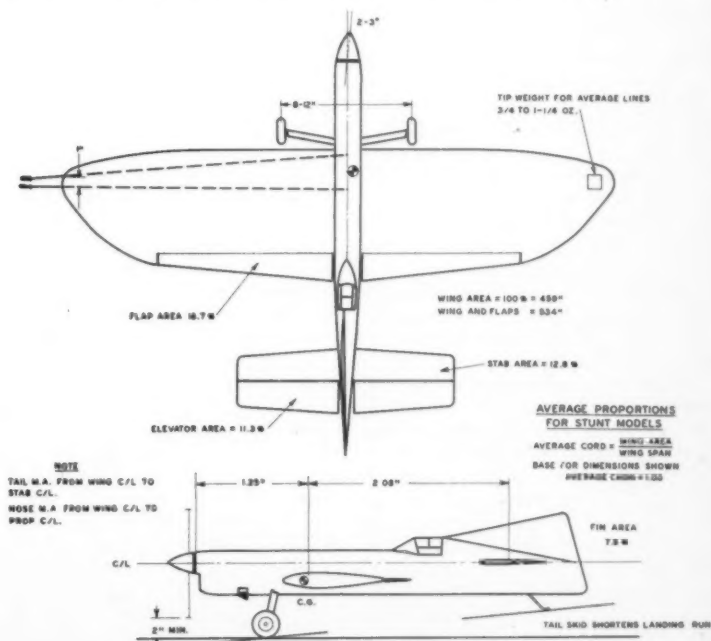
Ralph Yount holds Mars as Bob Palmer gets set for neat take-off and another smooth hop.

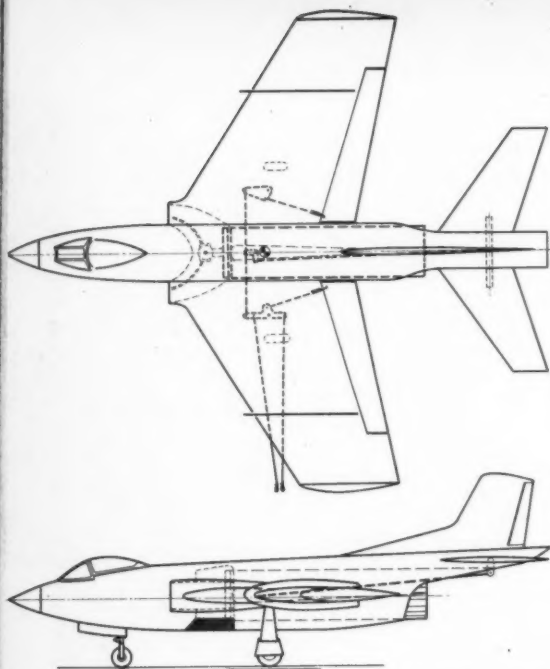
► Nature has created a number of problems, probably to give lots of people work, which make it impossible for an ideal machine to exist. Think of the mess if there were one ideal shape for an airplane, an automobile, a house, or anything! Therefore we must decide what we want and then slant our decisions to fulfill this end. Compromises always are necessary. Some of the data presented will be factual and proven, some will be the result of trained observation, and there will be some enlightened guesswork.

A brief word of physics seems appro-

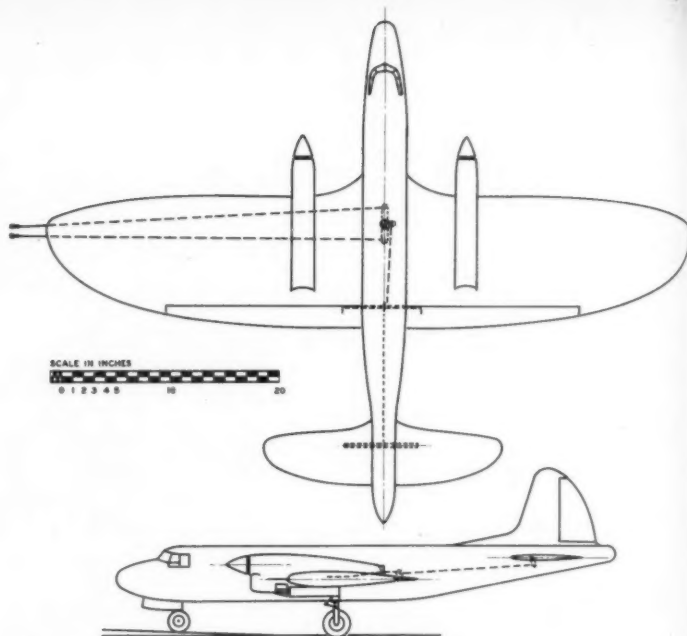
priate. Airplane flight is a matter of equilibrium. Forces on a ship in level flight are balanced. Thrust equals drag and lift equals weight. When we unbalance any one of these forces an acceleration is produced in the direction of the increased force. The take-off is a good example. At the moment of release thrust exceeds drag and weight exceeds lift. The helper balances the thrust and the ground balances the weight. When released the ship moves forward and the drag builds up. When lift equals weight and drag equals thrust we have steady level (Continued on next page)

Cheer up, for you don't need a slide rule to go inverted! Hang up this handy dope sheet.





maginary ducted fan scale controlliner displays these tricky controls.



Semi-scale twin-engined job here ties in flying tail with flaps. Try one?

flight. To climb we cause the wing to lift more so we move upwards.

The modern stunt ship did not explode upon the scene fully grown, but rather, grew up slowly. After we learned to keep a balky engine and overloaded airplane off the ground for a full tank, the logical step was aerobatics. The loop was our first milestone and it was the proud fellow who had enough power to turn a big lumbering loop. With the development of the symmetrical airfoil, we started bashing ships on inverted flight. Probably the biggest step forward was the development of the glow plug by Ray Arden, which relieved our puffing monsters of eight to ten ounces of dead weight and gradually gave us more power. Airplanes became smaller and more agile and stunt became aerobatics instead of balloon busting and wheel rolling plus 40 or 50 consecutive inside loops. Third big step was addition of flaps to the wing which gave us ships capable of the modern pattern with its square turns.

Just what makes a stunt ship a stunt ship and not a speed job? Or more simply, what characteristics do we need to stunt? The airplane must be capable of supporting at least 20 times its own weight. It must be stable for steady level flight, yet unstable enough to turn quickly without a lot of lost motion. It must be rugged due to high flight loads, yet light. Stunt ships almost universally use a symmetrical streamline for a wing profile. This is a low lift, low drag, combination so the area of the wing compared to other types is outsized. It must also fly at a reasonable

speed. The designer is allowed much latitude for artistic fulfillment but must keep proportions commensurate with full-scale airplanes. And last, but far from least, a high finish is important.

Stunt ships fall into two speed categories, fast and slow. Fast is 70 MPH and up, while slow will be below 70. The fast ship suffers several disadvantages, such as requiring high grade rhythm and coordination on the part of the pilot. Scoring is based on smoothness and repeatability of flight paths, which require a real maestro at the controls. The slightest mistake in judgment will result in a splat! Roundness is difficult to achieve and the judges stand a good chance of snapping a neck muscle following a square turn. Fuel feed is a larger problem due to the higher forces created by high speed turns and the airplane must be lighter than if it were flown slower. However, structure must be stronger, and consequently either heavier or more cleverly designed or both. The author has seen a few people capable of this type of stunt and it's quite a show stopper, but points accumulated are usually smaller than picked up by those whose maneuvers can be seen. The author enjoys nothing better than wringing out an 85-mph Half Fast, but for money we prefer 60 MPH.

The slow airplane is not without its problems either. At lower speeds, tug must be achieved artificially. However, the maneuvers, by being slower, can be flown through, with minor corrections in attitude being made during said maneuver. For instance, the re-

covery from a wingover is made at 4 feet. At 85 mph this 4 feet is used up in 1/32 of a second or this is the difference between a good pullout and a basket of pieces. Most judges like to see the maneuver and will give better scores for patterns where they can see everything you do. Your fuel flow problems will be easier solved and your airplane will undoubtedly last longer. The choice is yours and we'll show how to get either type.

In order to determine the size of our wing we have to start somewhere making assumptions. This is where experience helps. The formulae we will present are surprisingly close to the truth, but allow some latitude for errors which we take advantage of in our original assumptions. Much of the following information is printed in more detail, including some airfoil charts, in the 1951-52 Model Aeronautic Yearbook. Frank Zaic was kind enough to allow us to modify and present his work on Stunt Models. Let us assume an average large airplane with 432 sq. in. effective area—power from a .35 engine—giving a level flight speed of 60 MPH—wing span 50 inches and average wing chord 9 inches; built without flaps, it should weigh 2 pounds. That's enough for now.

First calculation is the Reynolds number. This number is a dimensionless constant at a fixed airspeed and wing chord. The higher the number, the more closely the airfoil works as it does on full scale aircraft. Normally it is used to allow accurate data to be produced with small airfoils in wind

EQUATION 1

$$N_R = 9350 \text{ VI}$$

V = AIRSPEED IN MILES PER HOUR
I = WING CHORD IN FEET

$$N_R = 9350 (60) \frac{9}{12}$$

$$N_R = 420,000$$

EQUATION 2

$$L = .000132 A V^2 C_l$$

A = AREA IN SQUARE INCHES
V = VELOCITY IN FEET/SECOND
L = LIFT IN OUNCES

EQUATION 3

$$R_{min} = 2 \sin 11.25^\circ B$$

B = LINE LENGTH or $R_{min} = .4B$

$$60' \text{ LINES } R_{min} = 24 \text{ FT}$$

$$70' \text{ LINES } R_{min} = 28 \text{ FT}$$

EQUATION 4

$$C.F. = \frac{W(V)^2}{32 \times R}$$

FOR C.F. WE WILL SUBSTITUTE
 L_{max} WHICH GIVES:

$$R = \frac{WV^2}{(32)L}$$

GOING A STEP FURTHER WE CAN
SUBSTITUTE OUR LIFT EQUATION
FOR L_{max} :

$$R = \frac{WV^2}{(32)(.00132)(C_l)(A)(V)^2}$$

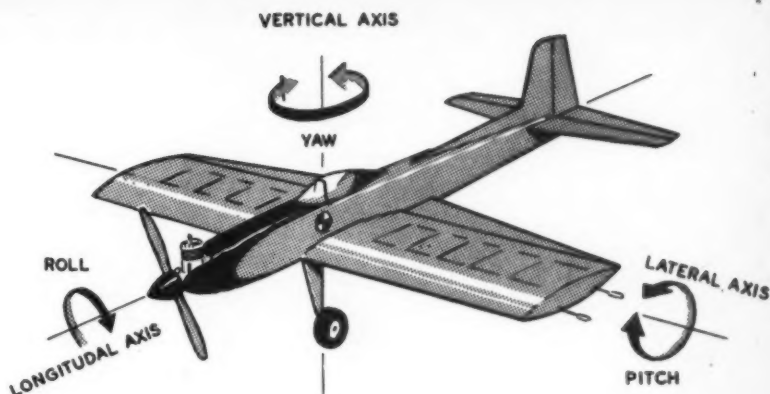
EQUATION 5

$$R = \frac{W}{.00423 C_2 A}$$

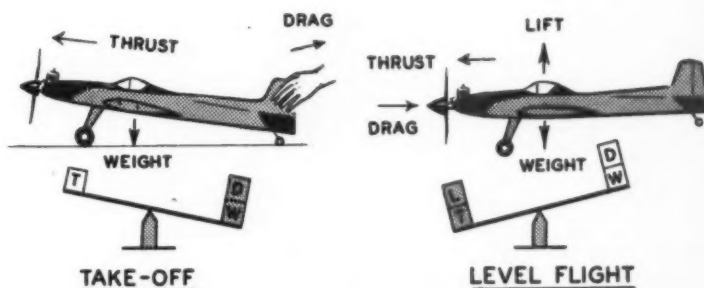
W = OUNCES
A = SQUARE INCHES
R = FEET

tunnel tests and to convert this into data useful for full scale use. Full explanations of this may be found in the Model Aeronautic Encyclopedia No. 2. For our stunt model it will be as shown in Equation 1.

Sounds big until we consider full sized Reynolds numbers run around 20 million. We will use this as a tool to look up lift coefficients from graphs. However, for our comparatively narrow range of Reynolds numbers and airfoils we shall list maximum lift coefficients for the more commonly used sections. At the end of this series of articles will be a list of books from which more specific and detailed data may be derived. Our Reynolds number mainly says "An airfoil (Continued on page 53)



CONTROL OF AXIS A MUST FOR STABILITY

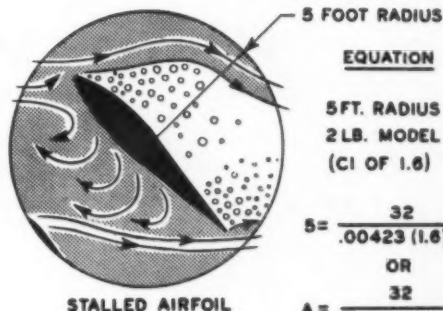


TURN WITH 12% AIRFOIL

$$R = \frac{32}{.00423 (.9) (432)}$$

$$R = 19.5 \text{ FT.}$$

OR A
39 FOOT DIAMETER



EQUATION

5 FT. RADIUS
2 LB. MODEL
(C_l OF 1.6)

$$S = \frac{32}{.00423 (1.6) (A)}$$

OR

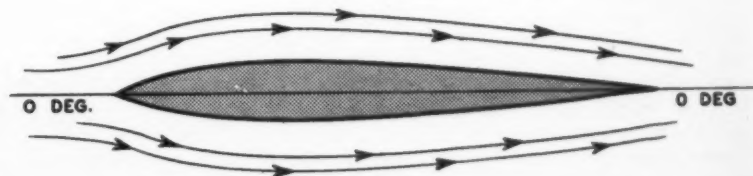
$$A = \frac{32}{.00423 (1.6) (5)}$$

COEFFICIENTS

NACA 0009	.85	@ 7°
NACA 0012	.90	@ 8°
NACA 0015	1.00	@ 10°
NACA .0018	1.15	@ 12°
NACA 0012 WITH FLAP	1.6	@ 8°

LEVEL FLIGHT MINIMUM A.O.A.

CL .1 PER (°) AOA = 0 LIFT





High cabin profiles have a right turn tendency under power. Lt. J. R. Becknell tunes needle adjustment before allowing ship to ROG.

MAKE *that Model* FLY!



Low wings will fly. Walt Mooney releases his scale Mooney Mite in the American class PAA Lead event at the Nats, believe it or not.

by JOHN SPRAGUE

Almost any model will fly if you give it a chance. So don't blame the airplane if fireworks start. The next time you have a new gassie to test-hop keep these facts in mind.

► With each passing year, the model airplane hobby seems to be attracting more and more beginners. Unfortunately, the number of people who try unsuccessfully to fly the models they build is astronomical.

However hard the manufacturer tries to make prefabrication foolproof, the flying of the model ultimately rests with the builder. And, because control line has so many natural advantages, easier-to-find sites among them, the manufacturer has favored ready-to-fly, and highly prefabricated craft, to be flown "captive." Comparatively little has been done about the flying of rubber-and gas-powered free flight models, the latter being the bigger problem by far.

As the gas-powered free-flight models are planned on paper they all will fly—or can be made to fly. But when the builder launches the plane it may loop, dive, spiral into the ground or just flutter around like a wounded duck. Getting it to fly properly calls for a procedure that the veterans mysteriously call "adjusting the model." A better word is "trimming."

To successfully trim his untested aircraft, the builder has to know what he is up against. What he is up against usually is a lack of understanding of why an airplane flies. Although the kit or magazine-plan project may be assumed to have the correct proportions and areas (so fundamental design is not the problem), it is the variations between finished planes that unbalances the designers skilful blending of "forces" and this, in turn, unhorses the green flier. Not understanding what goes on, he is unequal to the task of restoring the set-up the designer intended. No two planes are exactly alike, or fly alike even if they look alike. Happily, a couple of generations of modelers have worked out a system for trimming the new model.

Preliminary Check-out: First, does the model faithfully



Launching his Corben Ace scale model is John Sparnicht. Scale jobs can be tough to trim but the Corben is ideal subject to adjust.

follow the plan? That is, does it have the same angular setting of wing and tail, as seen in the side view, as specified by the plan? Does it have same dihedral, or up tilt of the wing?

Secondly, is it accurately constructed and assembled? When you look at it from the front, or from the top, do the flying surfaces line-up accurately? Or does the wing or tail droop low on one side and high on the other, or is the wing askew? Or is the rudder and fin cockeyed? Does the propeller pull in the direction specified—the plan may require down thrust (propeller tilts down) or side thrust (prop tilted to one side, usually to the right side when viewed from the back or top of the model).

Thirdly, are the flying surfaces warped? It may not matter how rough the covering looks but it is essential that wing tips or stabilizer or fin not be warped. Warps can be removed by holding the offending surface over a steam kettle, then twisting the wing to its correct angle, and holding it there while it cools, usually a matter of a minute for the entire operation.

Unless these things are as they should be, the model may be impossible to fly.

The Glide Test: The basic principle of trimming any free-flight gas model consists of making it glide properly first, afterwards adding further adjustments to control the flight under power. Since any adjustment made to improve or correct the glide, will afterwards drastically disturb the flight under power, the two types of adjustments must be kept clearly separated in the mind.

First step in gliding the model, is to check for tail heaviness (stalling), or nose-heaviness (diving). It is desirable to make glide tests over grass, not on pavement. Select a calm or near calm day. Wind can smash the average model during tests. If the plane follows the plans and is balanced at the proper point (the center of gravity, or CG, or balance point, can be checked by supporting the model with one finger at each wing tip), the ship should not stall or dive too violently. A small model is hand-launched for the glide test by pointing its nose at the ground perhaps a room's length away, and



High pylons want to lean to the right under power. Carl Wheelay, one-time FAI gas champ ponders thermals before cranking the prop.

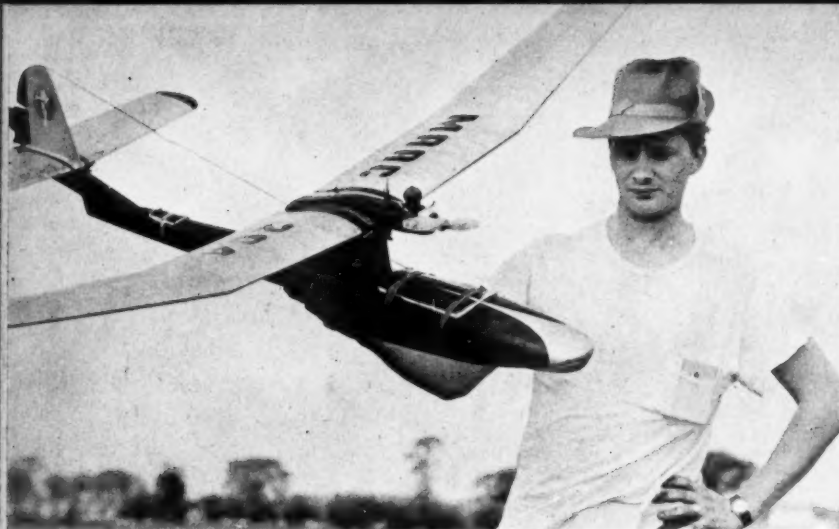
then shoving it ahead firmly and smoothly as it is released. Never throw the plane, or point it upwards, for either action will make the ship rear nose upwards, as if it were stalling—which it might not do at its normal flying speed. The great majority of free flight models can be hand-glided quite easily. Bigger and heavier models may require running a few steps while launching.

It sometimes helps to walk fast or run slowly, holding the model in level flight position until you get the feel of when it will lift from your hand. Running slowly forward you can wait for this slight feel, then assist the model very slightly as it is launched from the hand—but keep the nose down!

A proper glide is a straight line; the plane should land in its two wheels, never swoop three-point with the tail down. The latter landings look pretty but are almost a sure indication that the plane will stall when it flies faster under its own power. Actually, the best glide should look a trifle nose heavy.

If plane is tail heavy: Add weight to the nose (this shifts the CG forward), or increase slightly the positive angle of the stabilizer (increases tail lift). To alter angular setting of wing or tail, use a thin sliver of sheet balsa (1/32 on a small plane, 1/16 on a large one) or match cover paper, to pack under the appropriate edge of the flying surface. Where the wing is movable, it can be moved back slightly on the fuselage (moves the center of lift toward the back) to decrease tail heaviness. Additional glide tests are necessary, perhaps a half dozen or so, until the corrections are sufficient to smooth out the glide path as desired. If plane is nose heavy, apply any of the above corrections in reverse. Such corrections can be used in combinations, either for tail or nose heaviness, in stubborn cases.

Warning note: A stable flying machine always has slightly more of an angular setting in the wing than it does in the tail. It is not wise to alter the angle of the tail drastically, as too many people do, because, when it equals or exceeds the angular setting of the wing, the ship will exhibit extremely (Continued on page 61)



Though slightly overpowered by Amco 3.5 Diesel, Berkeley Seacat by Roy Bourke, Can., does well.

Radio Control News

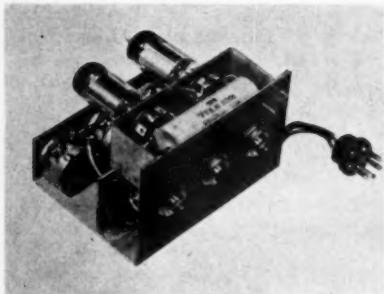
by **EDWARD J. LORENZ**

► What better way to start off the new year than with a letter like the one received from Mr. Donald Sump of Sheridan, Wyo. He saw our mention of Miles Wilson, who lives 450 miles away in Montana, and dropped him a line regarding RC work, since this is the first person he has run into in his part of the country. Mr. Sump, who is a public accountant and is 52 years of age, has made a practice of traveling more miles than we care to think of, just to get in some RC flying. Here's the part we liked, even though we won't be able to make it. Mr. Sump has offered to set up a flying session with FREE steaks for RC flyer and wife or

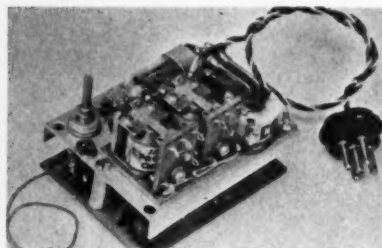
helper. You can't beat a good western steak, fellas. There will be an airport to fly from, with plenty of prairie nearby. Anyone interested should contact Mr. Sump and advise if they could make it on either Memorial Day or Labor Day. Maybe this will turn into another RC get-together for the prairie states, such as we have in other parts of the country. Mr. Sump went all the way to Los Alamos just to watch some RC flying. He came home and built a Berkeley Rudderbug and used Deltron RC gear. This start in RC work brought him up to getting the new Babcock 465mc 2-channel unit, which he will install in a Live Wire Champion. He has used practically all sets mentioned in this column and has had no trouble,



CG Electronics two-channel transmitter converts to three by inserting modulator unit.



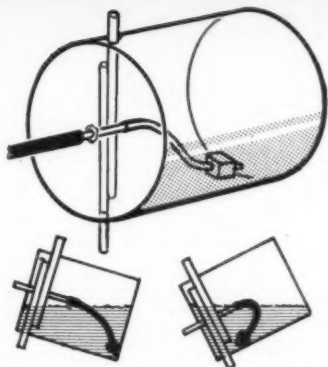
This photo shows the modulator unit referred to in the photograph immediately above. Neat.



And this is the CG two-channel receiver. Two Jalco relays and, right, the two-reed bank.



Speaking of equipment, the Babcock three-channel, showing servo, motor control, escapement, etc.



Chuck Boyer's baby food fuel tank. Requires right flex tubing, short line to work well.

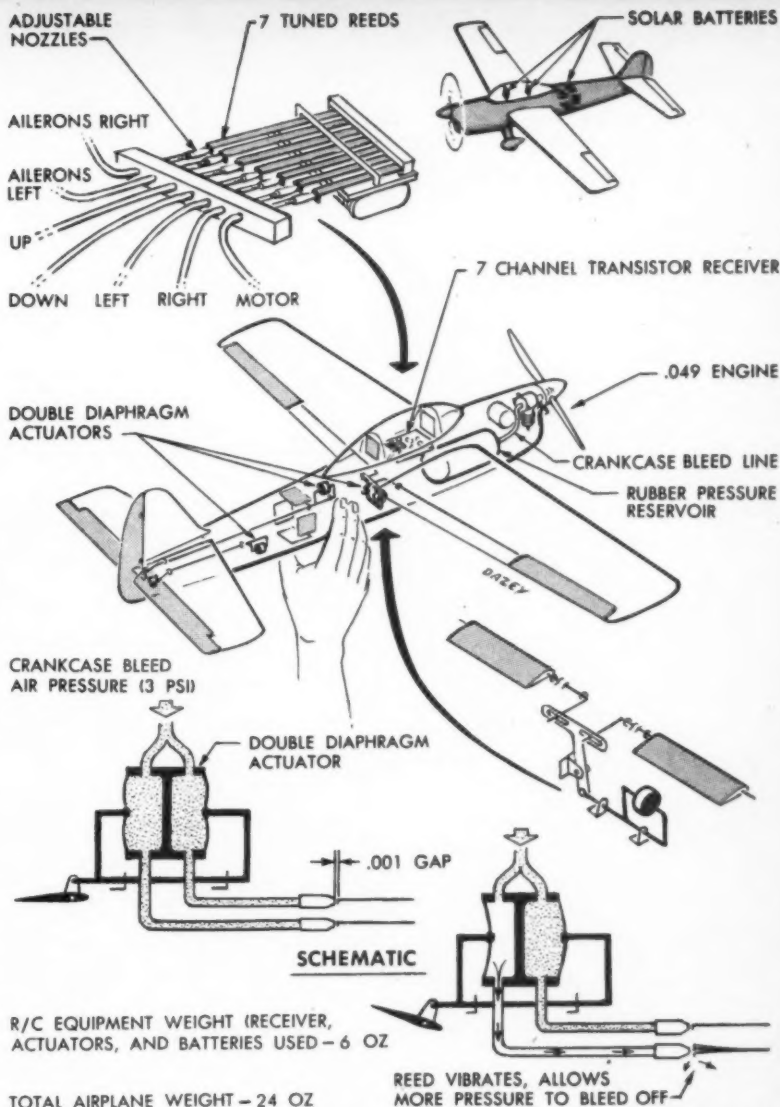
The so-called gentlemen's event is jumping now that the masses have taken over!

since they 'operate-out-of-the-box'. These units include Deltron, Badaco, Babcock and the Citizen-ship 27mc receiver. This last unit was highly recommended for its foolproof operation and we've had reports to confirm this from other sources. Anyone who can discuss the Ideal models from the days of Cecil Poli, could probably wrangle two steaks out of Mr. Sump.

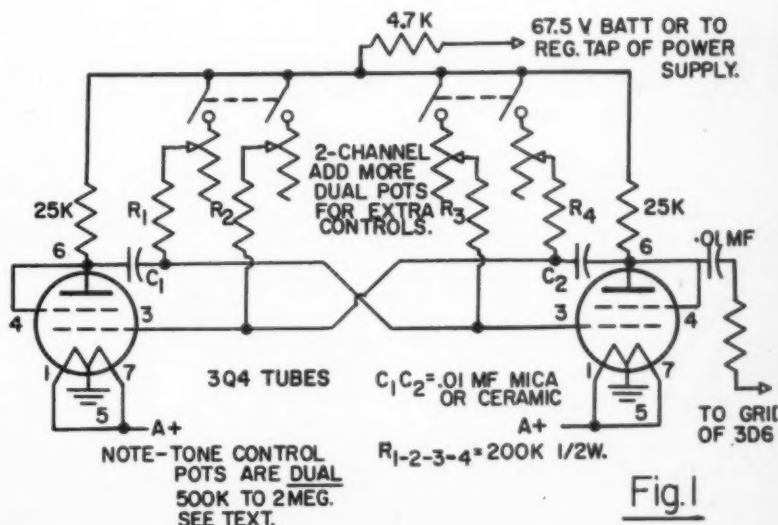
From Bob Rector, Box 199, Salisbury, N.C., comes news of his new Over & Under biplane, which should be finished by now. Using a Fox 35 and Schmidt 5-channel equipment, Bob is using ailerons on the bottom wing in addition to rudder, elevator, throttle and steerable tail wheel. This ship should bring some interesting information since Bob has received a considerable amount of advice to the effect that ailerons 'are no good'. This is one of those things where everyone talks about it but no one does anything. Good luck, Bob, and we'll keep everyone advised regarding the use of ailerons. (Ailerons should have differential action, perhaps as much as five times up as down, due to the greater drag of the down aileron -Editor.)

Are you one of the RC fans, builders or "designers" using buzzer type modulation directly into the grid of the crystal-controlled transmitter? We purposely placed quotes around the designer category since anyone versed in the basic principles of radio can see the trouble arising from such a system. Be sure to read TECHNICAL TOPICS for further details.

Stan L. Friedman reports on the First Annual Radio Model Contest held last September near San Diego which was sponsored by Convair. In Multi-channel, it was Dean Kenny, Howard Bonner and Jerry Slovacek; in Rudder Only it was Bill Williams, R. Happisch and Gary Hauch; (Continued on page 43)



Will it come to this? Frank Dazey let his imagination run wild on this futuristic racing job.



NEW

...AT THE REQUEST OF MODELERS FROM COAST TO COAST...



Hot Fuel Proof

BUTYRATE DOPE

IN HANDY 1-OUNCE BOTTLES AT

15¢

Plus **BIG NEW RANGE OF 24 POPULAR COLORS!**

Medium Green
Dark Green
Insignia Red
Dark Red
Maroon
Lemon Yellow

Orange Yellow
International Orange
Sky Blue
True Blue
Insignia Blue
Aircraft Gray

Battleship Gray
Aircraft Cream
Chocolate Brown
Olive Drab
Gloss Black
Insignia White

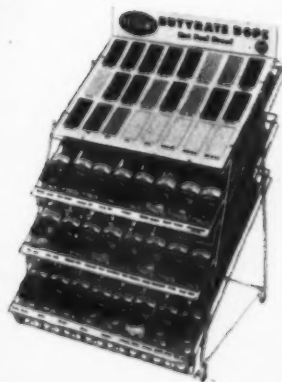
Gold
Silver
Sanding Sealer
Clear
Thinner
Gloss Top Coat





● Really big news for you! Now you can get Testor's unequalled-for-quality Butyrate Dope in handy 1 ounce bottles at just 15c — exactly the economy size you want for trim, detailing, any special decorative application where only small quantities of color are required. And the same superior formulation, of course: every property of high hiding power, easy brushing or spraying, controlled shrinkage, excellent rubbing, high flexibility, film toughness, pure color brilliance... *plus* the added special feature of being **HOT FUEL PROOF**, too. This is what you've been waiting for — perfect companion to Testor's Butyrate Dope in the familiar quarter pint jars — in your choice of a broader-than-ever range of today's 24 most-wanted colors! See your dealer now.

Look for this
handy dispenser
at your
dealers



TESTOR CHEMICAL COMPANY • ROCKFORD, ILLINOIS

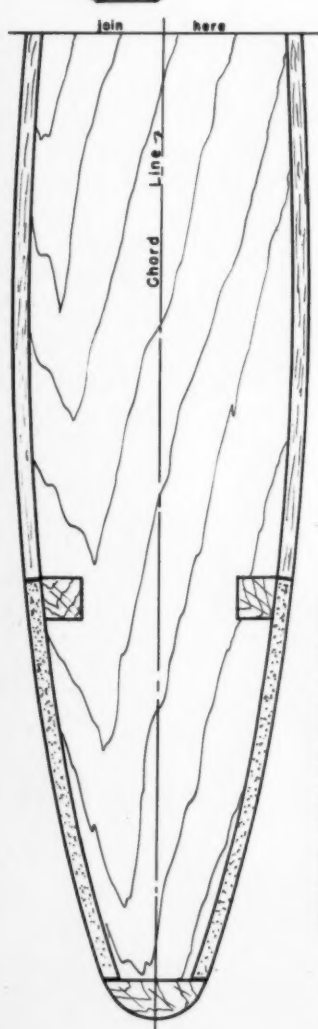
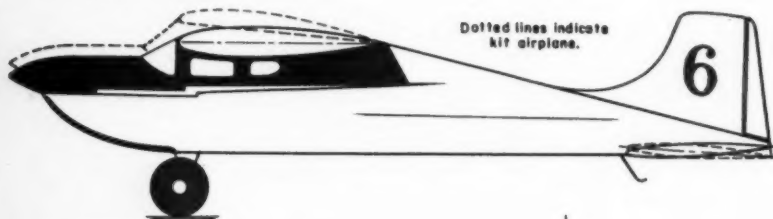
EUROPEAN SALES OFFICE: STOCKHOLM • STOCKSUND, SWEDEN

Symmetrical RC

How to convert the Live Wire Sr., or Cruiser, to symmetrical wing section. Idea can be worked out on other ships as well. The rib pattern is full size.

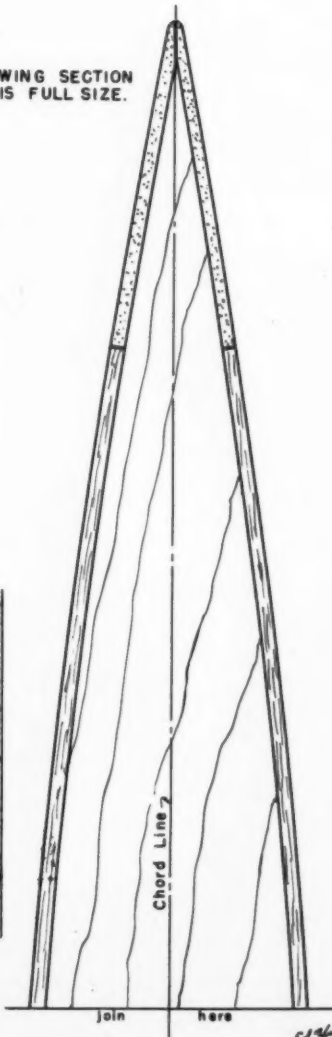
MODIFICATIONS:

1. Hold wing T.E. drop L.E. until wing chord line is parallel to thrust line.
2. Drop thrust line, deck & windshield 3/4" as shown.
3. Drop L.E. of stab. to bottom of fus., raise T.E. 3/8" above L.E.



WING SECTION IS FULL SIZE.

STRUCTURE SIZES ARE SAME AS KIT WING.



WORLD'S FINEST MODEL KITS by Sterling

SCALE MODEL AIRPLANE KITS

Kit	Plane	Price
C-1	The Monocoupe	5.95
C-2	Howard Pale	6.95
C-3	Mr. Mulligan	5.95
C-4	The Waco	6.95
C-5	Polish Fighter	6.95
C-6	S.E. 5	6.95
C-7	Ryan ST	6.95
C-8	Fokker D-7	6.95
C-9	Corsair	6.95
C-10	Nieuport-28	6.95

SCALE MODEL AIRPLANE R. C. FREE FLIGHT KITS

Kit	Plane	Price
FS-1	Piper Tri-Pacer	12.95
FS-2	Cessna 180	6.95
FS-3	Mambo RC Trainer	6.95
FS-4	Monocoupe	12.95

STUNT MODEL AIRPLANE KITS

Kit	Plane	Price
S-1	Ringmaster	3.50
S-2	F-51 Mustang	3.50
S-3	Yak-9	3.50
S-4	Spode Master, Jr.	2.75
S-5	Ringmaster, Jr.	2.50
S-6	Super Ring Master	4.95
S-7	Curtis P-40 Tigerhawk	2.50
S-8	Messerschmitt Me-109	2.50

FUEL TUBING

Tubing	Size	Price per Ft.
Sterline	Small	.20
Sterline	Regular	.25
Ster-X	Small	.10
Ster-X	Regular	.15
Ster-X	Large	.20

ELECTRIC MOTORS

Kit	Price
LB-139 Lil Beaver	1.39

MODEL BOAT KITS

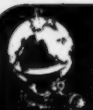
Kit	Boat	Price
B-1	Richardson 27' Cruiser	6.95
B-2	Higgins 17' Speedster	5.95
B-3	Chris-Craft 47' Buccooneer	7.95
B-4	Century Resorter 20'	3.25
B-5	Century Sea Maid 20'	2.95
B-6M	Chris-Craft 32' Cruiser	10.95
Set B-6F	Metal Fitting Set for C.C. 32'	3.95
B-7M	Chris-Craft 50' Catalina	12.95
Set B-7F	Metal Fitting Set for Catalina	5.50
B-8M	Century Sea Maid 20'	8.95
Set B-8F	Metal Fitting Set for Sea Maid	4.50
B-9	Higgins 26' Express Cruiser	3.95
B-10M	Marco 40' Cabin Cruiser	11.95
Set B-10F	Metal Fitting Set for Marco	4.95
B-11M	Chris-Craft 63' Motor Yacht	20.95
Set B-11F	For C.C. 63' Motor Yacht	8.50
B-12	Sea Dart	3.95
B-13M	Chris-Craft 21' Monterey	6.95
B-14	Plastic CC 42' Exp. Cruiser	1.98
B-15M	Chris-Craft 42' Corvette	26.95
Set B-15F	Metal Fitting Set for Chris-Craft 42' Corvette	9.95
B-16	Chris-Craft 21' Cobra	2.98
B-18M	American Scout	16.95
Set B-18F	Fitting Set for Amer. Sc.	10.95

MARINE DRIVE SETS AND FITTINGS

Fitting	Price
Electric Marine Drive Set	2.25
1/4A Gas Marine Drive Set (1/4" Dia.)	2.95
A Gas Marine Drive Set (1/4" Dia.)	3.95
BC Gas Marine Drive Set (1/4" Dia.)	3.95
1/4A Universal (1/4" Dia.)	.85
1/4A Flywheel (1/4" Dia.)	.85
1/4A Shaft & Stuffing Box (1/4" Dia.)	.25
A Universal (1/4" Dia.)	1.25
A Flywheel (1/4" Dia.)	1.25
BC Universal (1/4" Dia.)	1.25
BC Flywheel (1/4" Dia.)	1.25
A or BC Shaft & Stuffing Box	.35
1/4A Nylon Propeller (1" Dia.)	.35
A or Small B Nylon Propeller (1 1/4" Dia.)	.75
L.H.	.75
R.H.	.75
B or C Nylon Propeller (2" Dia.) L.H.	1.00
B or C Nylon Propeller (2" Dia.) R.H.	1.00

Sterling

35



WORLD ENGINES

P. O. BOX 905 - WARREN, OHIO

1 We definitely sell to dealers at regular trade terms.

47 Serving dealers in 47 States & Canada

13 Mailings to dealers in 1956.

24 Hour service!

FREE Dealers—write now for literature & get free copy of "International Engine Review" booklet!



Ron Draper shown with his Max 15 powered "CRESCENDO 87". Mr. Draper, who won the 58 F.A.I. World Power Championship using a Max 15, says, "The superior workmanship of O.S. engines coupled with their high and consistent performance make them the obvious choice for any contest-minded flyer."

**MAX-15
WORLD
POWER
CHAMPION
\$10.50**



- | | |
|--|---|
| <input type="checkbox"/> Jato | <input type="checkbox"/> David Andersen .06 ——— 10.95 |
| <input type="checkbox"/> OS Mark II Jet \$19.95 | <input type="checkbox"/> Frog .15 BB ——— 19.95 |
| <input type="checkbox"/> OS Jet Starter — 7.95 | <input type="checkbox"/> Modified ——— 14.95 |
| OS GLO — Low Flyer | <input type="checkbox"/> Frog .15 BB ——— 14.95 |
| <input type="checkbox"/> Max-1-35 ——— 12.95 | <input type="checkbox"/> Frog .09 Ultra-Motie Induction — 9.95 |
| <input type="checkbox"/> Max-1-29 ——— 12.95 | <input type="checkbox"/> Superdignity .19 (G-27) ——— 13.95 |
| <input type="checkbox"/> Max-1-13 ——— 10.50 | <input type="checkbox"/> Superdignity .049 (G-28) ——— 7.50 |
| Super Tigre — with plug | <input type="checkbox"/> Superdignity (G-28) .050 ——— 7.50 |
| <input type="checkbox"/> G-20 .15 Lap BB 13.95 | <input type="checkbox"/> Superdignity .09 (G-31) ——— 12.95 |
| <input type="checkbox"/> G-21 .29 Lap BB 16.95 | <input type="checkbox"/> Dian .09 BR ——— 15.95 |
| <input type="checkbox"/> G-21 .35 Lap Combust ——— 13.95 | <input type="checkbox"/> Dian .12 BR ——— 15.95 |
| <input type="checkbox"/> G-24 .60 Race BB 23.50 | |
| R/C | |
| <input type="checkbox"/> OS Minitrone Receiver 27 1/2 MC ——— 18.95 | <input type="checkbox"/> Rocket-China (Illustrated) International Eng. Review — .35 (Plus 5c postage) |
| <input type="checkbox"/> OS Max Compound Equipment — 6.95 | |
| <input type="checkbox"/> OS Max Motor Control Equipment — 4.95 | |
| DIESELS | DOMESTIC ENGINES |
| <input type="checkbox"/> Oliver Mark III .13 ——— 24.95 | <input type="checkbox"/> Fox .19 ——— 12.50 |
| <input type="checkbox"/> Oliver Mark III .15 mod. ——— 32.95 | <input type="checkbox"/> Fox .29 ——— 15.95 |
| <input type="checkbox"/> David Andersen .15 ——— 14.95 | <input type="checkbox"/> Fox .35 ——— 15.95 |
| | <input type="checkbox"/> Fox 29R ——— 27.95 |
| | <input type="checkbox"/> Fox .50 ——— 23.50 |

CANADA—Write to Academy Hobby, 2824 W. Eglinton, Toronto, Ont.
ORDER INSTRUCTIONS—Send check, M.O.—if C.O.D. Include \$1.00. Free airmail postage—24 hour service.

World Engines - Box 905 - Warren, O.

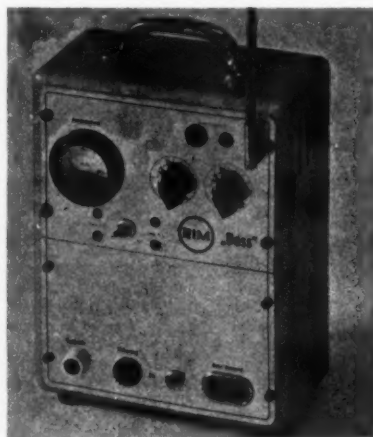


P. G. F. CHINN

More RC Gear for Germany

In marked contrast to the situation in England, where, at the present moment, only one manufacturer (E.D.) now offers complete RC equipment, the range of radio gear available in Germany continues to expand.

From Graupner comes "Kinematic," a motor-driven four-position servo intended primarily for boats, but appearing to have some possibilities for aircraft use. And, to accompany "Miniking" transistorized receiver previously mentioned in this column, Radio-Rim of Munich announce the "Boss" 27.12 MC crystal-controlled transmitter. According to reliable sources, this, the product of a firm long known to radio



Neat crystal-controlled transmitter for 27.12 by Rim, of Munich. 400 cycles tone modulation.

hams, promises to be the best outfit thus far offered to German modelers.

News from France

This column's periodic regrets that we do not have enough news from France are at last bearing fruit. Following on the worthy efforts of the USAF Chad club to get together with French modelers, we have obtained a most comprehensive assessment of the French modeling situation from M. J. L. de Neufville, a Parisian modeler of long standing and a MAN reader since 1936.

French modelers, asserts M. de Neufville, are as active and skilful as many others but not very numerous and generally not contest minded. They are also poor and that is why most of them fly gliders. Materials are obtainable but France suffers from being a highly centralized country: that is to say, French life is largely centered around Paris and this is also true of modeling supplies. Except for simple basic materials, one has to go to Paris, where, generally, modelers' requirements are adequately dealt with. French motors are, as a rule, unexciting, but we must realize that they are general-purpose engines; they must turn large props as well as small ones and power a boat as well as a stunter, a free-flight or large

FOREIGN NOTES

A monthly world-wide round-up of technical developments, designs, significant industrial products.

RC job. Several high-powered engines do exist, the most well-known being the Micron 29 and 60 racing units, but they are very expensive and are seldom, if ever, on sale outside one or two Paris hobby shops.

Our correspondent's remarks bear out the conclusions reached by the writer's brother who, in the South of France recently, searched in vain for a well-stocked model shop and, of such supplies as were available, found prices prohibitive.

M. de Neufville concludes that he believes French engine makers to be following the wrong road and suggests that they should cut down the number of different types they at present make in order to concentrate on a few essential models which could employ pressure die-castings in place of sand castings and be lighter, cheaper and sold in larger quantities.

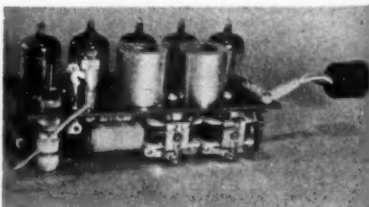
Britain's Carter Customs

By recording an almost unbelievable 139.8 mph to set a new (subject to FAI confirmation) Class I world record, plus a convincing win in the 1956 World Speed Championships in Italy, Ray Gibbs' Carter-Special motor proved itself the world's hottest .15 cu. in. mill to date.

Carter motors are one-off custom-built specials for which Fred Carter takes the crankcase of one well-proven racing motor (usually American) and proceeds to put in a completely new set of innards in accordance with his own ideas. In the case of the present .15 motor, the crankcase/cylinder casting is that of a McCoy Red Head 19. It is evident that the motor puts out more power than a stock Red Head, despite a 25% reduction in displacement.

Czech Nationals

Of the East European countries, the most advanced in matters modeling are Czechoslovakia and Hungary. The 1956 Czech Nationals, held at the close of the season at Vrchlabi, were well supported in all nine events. In FAI gas, Jiri Cerny of Prague just beat his better known namesake Rudolf Cerny to return 13.58 for five flights, including three maxes. He used a VTO pylon model, 400 sq. in. wing 40% stab area and powered by a W. Gorman Webra motor. Model featured elliptic stab and outer panels and Goldberg sections. It weighed 18 oz. Rubber event winner Zdenek Mach used a model fairly typical of current Wakefield design: 45 in. span, 45 in. long with 25% stab and 20% in. twin-blade folding prop, Winning Nordic 42 glider by Jan Heyer was a



Japanese OS Minitrone two-channel receiver. Has five tubes: one 1T4, one 1U4, and three 3Q4's.

level.
ucts.

es do
they
ever,
hobby

r out
riter's
e re-
cked
were

be-
fol-
that
dif-
an or-
ental
died
be quan-

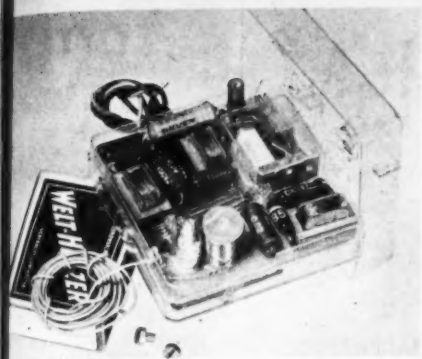
vable
FAI
plus
speed
rter-
rld's

built
the
motor
at in
ord-
the
nder
19.
more
ete a

the
are
1956
the
l in
r of
me-
for
He
ing
cor-
ptic
rec-
ent
rily
45
and
ing a

0's.

17



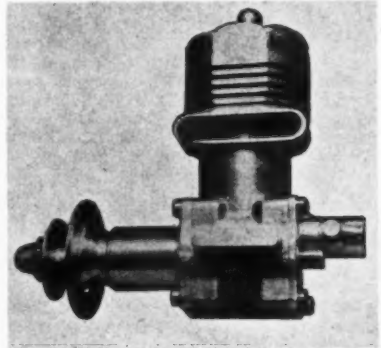
Rim's Miniking tone receiver with transistor power converter, operates 24 hours on only 6V.

graceful, slim fuselage job with modified MVA 123 wing section and small 17% stab.

Winning speed jobs were of typical design. Top speeds were 109.3 mph in the .15 class, 124.3 for the .30's and 133.6 for the .60's. Speeds on this occasion were not outstanding, having regard to high performances set up by the Czechs in previous speed events. (For example, in the FAI World Speed Championships, the Czech team returned a higher aggregate than any other country, as a result of which next year's Championships will be held in Czechoslovakia.) Maximum speed in the jet class was 136 mph. Winning stunt job by Miroslav Herber had a .35 cu. in. motor—an unfamiliar displacement in Eastern Europe which appears to suggest U.S. influence, as does the use of a NACA 0018 wing section. The spin spanned 51 in., had 484 sq. in. wing and weighed 30 oz.

Interesting Aussie Wakefield

Coinciding with the decision to postpone until 1958 (and probably modify) the scheduled FAI rule changes relative to Wakefield and free-flight gas models,



Carter Special .15 that set record of 139.8 is better than a Mac Red Head .19. Some pumpkin!

have come to a number of reports from keen contest men who, in anticipation of the rule changes coming into effect in 1957, have been testing out "new rule" models during the past season. While it is a pity that the keen efforts of these enthusiasts are not to be rewarded with a chance to fly their new models in official 1957 contests, their reports are illuminating and, in most cases, present a much less dismal picture of "new rule" models than has been envisaged hitherto.

One such report comes from Paul Van Leuven of Perth, Western Australia. In mild, cool conditions, his "1957 rule" Wakefield, with (Continued on page 57)

NEW ANNUAL!!!

THIS IS IT! THE 9th OF THE SERIES
"1956-57 AEROMODELLER ANNUAL"

The book you have waited a year for. Published but once per year. This is the 9th of series. (Some past year's Annuals now bringing \$10.00 per copy as collectors items). Coverage as follows. 160 cloth bound pages. Writers from England, France, Germany, Italy, Sweden, etc. have all banded together to give the very best of modelling. Free Flight Scale such as "Longster Wimpy", "Drum Condor", etc., etc. Latest Drawings of Speed and Stunt Control Lines. Latest Radio Control contest winners, latest Radio Actuators, circuits, etc. The World's Best A/2 Gliders, Wakefield and FAI Power models all are given with Drawings and Photos. This is truly a book for ALL Model Builders, be you scale or contest minded. EXTRA ADDED—Build your own eight plane (real plane) article by H. Best Devereux (The ultra light plane builder of France) EXTRA ADDED—Radio Control HYDRAULICS as used by Famous Germany Contest Winners. These two articles worth book price.

SCALE MODELS—RADIO HYDRAULICS—REAL LIGHT PLANES
CONTROL LINE—WAKEFIELD—A/2 GLIDERS—FAI GAS

Full Price Deluxe Cloth Bound edition \$2.98
10 DAY MONEY BACK GUARANTEE IF NOT SATISFIED

SEND ONLY \$2.95 FOR THIS \$11.95 BOOK

"AIRCRAFT CAMOUFLAGE AND MARKINGS 1907 to 1954"

Here are 212 pages, CLOTH BOUND, on high gloss paper, size 11" x 9" Contents, the largest, most complete collection of information, on both Aircraft Camouflage and Markings that we have ever had the pleasure to offer our Customers. There are 28 pages printed in full multi color covering the Camouflage and markings of such World War Aircraft as, Spad, Sopwith, Fokker, etc., etc. Additional to this there are hundreds of clear photos of World War I Aircraft showing in great detail their Squadron Numbers and insignia. All of the photos in this book have been chosen to bring out the high detail of this interesting work. World War II and the Korean War are also covered, showing all types of Bomber nose insignias, the Camouflage etc., many, many of these are also in full multi color. This book is a MUST for all scale builders. Make sure your colors and markings are CORRECT on your next scale model. (This book published by same persons who published "Aircraft of the 1914-18 War")

Place me on order for the "Aircraft Camouflage and Markings 1907-1954." I enclose \$2.95 and will pay balance of \$9.00 in 3 monthly \$3.00 payments.

Send "Camouflage" book above, full \$11.95 enclosed.

Sample pages and circular about above book 25c
10 DAY MONEY BACK GUARANTEE IF NOT SATISFIED



SEND ONLY \$2.95 FOR THIS \$11.95 BOOK

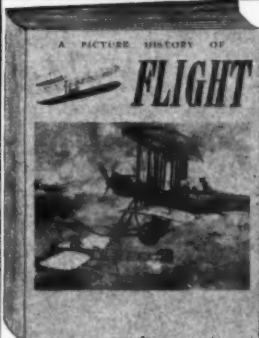
"PICTURE HISTORY OF FLIGHT"

Here are 196 pages, CLOTH BOUND, on high gloss paper, size 11" x 9" containing 650 LARGE clear photos of old time Aeroplanes. (These are ALL Photographs NOT sketches, you would pay over \$200.00 for the photos alone in this book if you purchased them separately). Contents 3 Chapters, each covers an era of old time planes. Starting with Balloons on to Otto Lilienthal and his Hango gliders. Langley, Bleriot and his Channel Crossing of the 1800's. Next the Wright Brothers, Santos Dumont, Eliehammer, Curtis and Vossin Biplanes, etc. The 1914-18 War is covered in great detail with hundreds of photos of War Planes plus write ups about the Pilots who flew them, along with Photos of Richthofen the "Red Knight of Germany". The "Flying 30's" are covered with all sorts of light planes, plus photos of Lindbergh's "Spirit of St. Louis" and other planes that tried to make the Trans Atlantic flight. Book gives a full story of Flying and pilots from the very beginning. Excellent for those who build True Scale models and those Studying Aviation in any form.

Place me on order for the "Picture History of Flight." I enclose \$2.95 and will pay balance of \$9.00 in 3 monthly \$3.00 payments.

Send "Picture History of Flight." \$11.95 enclosed.

Sample pages and circular about above book 25c
10 DAY MONEY BACK GUARANTEE IF NOT SATISFIED



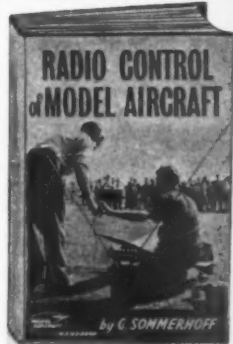
NEW RADIO BOOKS

"RADIO CONTROL OF MODEL AIRCRAFT"

BY G. SOMMERHOFF

First of 3 new Cloth Bound Radio Book series. Contents over 160 pages. Approximately 35,000 words in its text. Over 150 Radio Schematics and Drawings. Elementary course is given for beginners. For the more advanced the book gives all of the following. 3 different Transmitters. 4 different Receivers. 7 different escapements and serves. Each one of these Receivers, Transmitters and Actuators are fully covered with a complete drawing of the Schematic, a Complete instructions on how to build and a Complete tuning and adjusting instructions. Full list is given of each as to its needed components, etc. Charts tell wire resistance values. How to figure Slug Tuned Coil windings. Full trouble shooting information for these owning Factory Built sets, etc. Many of the Actuators, etc. in this book are FULLY PATENTED and have Never been shown before in any other book or magazine. The publisher gives you the right to use these FULLY PATENTED Sets for your own personal use. Profit from this, the Author's years of experience.

OVER 160 PAGES—85,000 WORDS—CLOTH BOUND
COMPLETE SCHEMATICS—PATENTED MULTI CONTROLS
FULL PRICE in Deluxe Cloth Bound edition \$3.98
10 DAY MONEY BACK GUARANTEE IF NOT SATISFIED



OTHER RADIO BOOKS

Radio Control of Model Aircraft \$3.98
Radio Control of Model Ships, Boats and Aircraft \$3.98
Simple Radio Control \$2.98
Radio Control Models \$2.98

PLANSBOOK—Contains over 1,500 different models
World War One Scale, Radio Control, Gliders, etc.
each Plansbook comes with a \$1.00 Credit Voucher for future purchases \$1.00

OTHER OF OUR WORLD FAMOUS BOOKS

I Flew for the Fuhrer \$4.98
The First and the Last \$4.98
Stuka Pilot \$4.98
Soaring Pilot \$4.98
Dangerous Skies \$4.98
Great Airman \$4.98
Contest Sailplanes \$2.98

MAGAZINES—"Aeromodeller"—"Model Maker"—"Model Aircraft" each \$4.50 year

Check off order above. Add 25c postage per book. Print your name and address in column this ad
GULL MODEL AIRPLANE CO., 10 EAST OVERLEA AVE., DEPT. M-5, BALTIMORE 6, MD.

SPECIAL

All 4 Radio Control Books as listed at left a \$13.92 value. All 4 SPECIAL \$9.98

BOOK REVIEW—Contains write ups, sample pages, Photos, etc., of over 200 different Model Books, Aircraft Story Books, World War One Books, etc. each Book Review comes with \$1.00 Credit Voucher for future purchases \$1.00

SCALEMASTER MODELS NOW DIRECT-TO-YOU!!!

Yes... SCALEMASTER MODELS are now sold DIRECT FROM FACTORY-TO-YOU only. Our new policy & expanded facilities bring you a new expanded line of wonderful super detailed scale control line models. Models of such planes as the Ford Tri-Motor, Handley-Page Bomber, Curtiss Robin, Stuka, P-38J and others. Every one a "Master of Scale."

Order one of these great kits today, some are not quite ready, but advanced orders are being taken. Models shown in this ad are ready to go... so order now on our satisfaction guarantee.

Our new 1957 catalog is ready now too! It's free with every order, or we will send you a sample plan of the Boeing F4B-4 and the 1957 catalog for \$25.



77" FORD TRI-MOTOR

FOR SINGLE OR MULTI-ENGINE OPERATION

Back again — the fabulous 77" wing span model of the FORD TRI-MOTOR. A real challenge to any modeler. Includes giant two sheet 36 x 54 plans, corrugated aluminum foil, choice balsa wood, ready formed landing gear, turned cowling, die cut plywood, decals, sheet balsa for covering. Detachable wing for ease of transportation. Designed for two .79's or one .80. Complete instruction for applying corrugated foil. Satisfaction guaranteed, yours for Only... **\$19.50**



45" JUNKERS Ju 87 "STUKA"

The terror of many in early World War II — the "STUKA" Now reproduced in a "T" exact scale model as only Scalemaster can. True to scale in every respect, even including German decals. This kit builds into a 45" wing span beauty, and includes die cut parts, formed canopy, formed landing gear, sheet balsa for covering, highly detailed plans and instructions. No other kit of this dive bomber has ever offered so much. Satisfaction guaranteed, yours for Only... **\$8.95**



BOEING F4B-4 CURTISS JN-4

One of the most popular shipboard fighters of the early 1920's, the JN-4 is one of the best detailed models ever made. Includes die cut wood, scale wheels, decals, hardware, data sheet, etc. 30" wing span for 14 to 16 power. Satisfaction guaranteed.

\$6.50

Shipping Weight 4 lbs.

\$6.50

Shipping Weight 4 lbs.

OTHER SCALEMASTER KITS

SM101 42" Stearman SR-10 Reliant (Sh. Wt. 4 lbs.) \$ 5.95
SM106 52" Lockheed P-38J Lightning (Sh. Wt. 8 lbs.) READY
SM110 50" Handley-Page O/400 WWI Bomber (Sh. Wt. 7 lbs.) IN
SM112 41" Curtiss OX-5 Robin (Sh. Wt. 4 lbs.) FEB.
SM111 57" DeHavilland Dove twin engine (Sh. Wt. 9 lbs.)



RUBBER TIRE WWI WHEELS

1" scale rubber-tired disc type old time wheels, 2 1/2" diameter. Only \$1.00 per pair postpaid.

Order your favorite model now. Be sure to add 10% extra for packing and postage. Any overpayments will be promptly refunded. Catalog free upon request. Payment add 20% Michigan residents add 3% for sales tax.

SCALEMASTER MODELS, INC.
28 IONIA, GRAND RAPIDS, MICH.

How Good Are the Russians?

(Continued from page 11)

ing, test-flying, the actual contests, prize-giving and sight-seeing, lasted nearly three weeks. Added to this, it is reported that most of the competing teams had undergone two to three weeks "training" in their own countries immediately beforehand!

All this is in strange contrast to the urgency of Western national and international contests. Seldom do we spend more than two or three days in conducting an international meet and as many as sixty modelers will make nearly three hundred flights in a single day in an event like the Wakefield. The difference in attitude is quite basic and creates a situation which is slightly paradoxical having regard to the political philosophy of the Soviets. In the Western world, the unknown modeler has exactly the same chance as the expert. He can buy the world's best materials, motors and accessories and, by his own individual and unsponsored efforts, he can reach the level of the expert and, with him, represent his locality or country. If he goes abroad to compete for his country, he, and the famous expert will be likely to travel modestly and to be accommodated in barracks, hangars, or even tents. The program will be swift and full of hard work and a few days later he will be back home again, probably a bit breathless at the pace of things. If, instead, he elects to fly purely for the fun of it and has no contest aspirations, he can still enjoy the best in materials and equipment.

Most of the modelers of Russia and the Soviet satellite countries, on the other hand, can only hope to enjoy the best facilities that the hobby has to offer when they, in return, have something to offer their country. For example, for this select few, there are often available specially built motors. These are developed by the official modeling institutes and constructed with the assistance of the nationalized industries and are unobtainable by the ordinary modeler.

In fact, modeling for the fun of it has far less of a place in Russia than in America or Britain. A few of us may tend to adopt a slightly lofty attitude towards prefabricated kits and other evidence of modeling for the millions that exists in the West. But it is by such commercialization and the wide interest fostered by the distribution of kits, etc., assisted by second-to-none modeling magazines, that we now have industries which so ably provide us with abundant and varied equipment, technical innovations and first class materials.

We have mentioned the high standard of flying of Russian Wakefield enthusiasts. This is certainly a class in which the Russians can compare favorably with the best that the West produces. In the Nordic A2 towline class they appear to be a little below international standards, however. Nor, on their showing in the last three Soviet Internationals, do they rate more than an average grading in free-flight gas at the present time. This appears to be due, at least in part, to the lack of powerful motors and to a tendency to run available motors at speeds well below their potential maxima.

A commonly used motor for both free-flight and control-line in Russia, is the MK-12. Designed by O. K. Gajevsky, a leading member of the Russian DOSAAF movement, it is a twin ball-bearing 2.5 c.c. (.151 cu. in.) Diesel. One or two of these engines have found their way westward via the satellite countries and thence

through neighboring Western countries.

As regards performance, the MK-12 starts easily and runs well. It seems to be most happy on a prop of about 9 in. diameter and 6 in. pitch. The rpm is then around 9000 which is reasonably good and comparable with the average European .15 cu. in. Diesel on a similar sized prop. The actual horsepower that can be realized for contest purposes, however (slightly under .22 bhp at 12000 rpm on our test) is appreciably less than that obtainable from the best .15's available in Western countries.

Substantial claims have been made for a revised version of the MK-12s, known as the MK-12k. This model has a shock-absorber contra-piston set-up similar to that of the O.K. Cub Diesels and a special combustion chamber shape incorporating an "anti-detonation" cavity. Outputs of circa .35/.36 bhp (i.e. about 10% higher than for the best Western .15's) have been mentioned for this model. On the showing of the MK-12s, these figures seem more than a trifle optimistic and, in fact, we have it on the authority of one of the top Russian fliers that the MK-12k gives no more performance than a stock E.D. Racer—i.e. about .26 bhp.

We cannot believe, however, that the Russians, if they are to expand their participation in World Championship events, will be content to rely on second rate motors for the power events. There is every reason to suppose that the official modeling institutes will be hard at work to produce an engine capable of challenging the best available elsewhere. The manner in which the Czechs, through their own model aviation research center at Brno, have developed small .15 cu. in. racing engines actually superior in performance to our own factory-built high-performance glow .15's is an indication of how this can be achieved.

Russian models of today are generally similar to those of the West, especially in the recognized FAI classes. Some radical differences in structural technique are, however, evident in the Wakefield rubber class.

There is no doubt that, despite the almost fanatical loyalty to the Wakefield shown by many noted exponents in the West and the somewhat excessive space that has hitherto been devoted, in some European magazines, to Wakefield models over a period of many years, the Russians' models are fully equal to those of the West in this highly developed class. That they achieve this without the use of balsa and by the adoption of some highly complicated structural designing is all the more creditable.

The models flown by the leading Russian Wakefield exponents, such as were seen this year at both the Soviet States Internationals and in the F.A.I. World Championships in Sweden, were mainly constructed from a native reed. This was supplemented by hardwoods where rigidity was of prime importance, such as in wing spars and longerons. Resulting structures were light and quite resilient. At the same time, they appeared to be reasonably war-resistant in changing atmospheric conditions. This was no doubt due to the considerable use of anti-distortion diagonal bracing.

Configuration generally favored is a long-fuselage, parasol wing layout with tip dihedral. Fuselages are mostly of square or diamond section. Propellers are mainly twin-blade folders with blades carved from hardwood. Much of the rubber strip used in Russia and many East European countries is of round section, 2-3

(Continued on page 42)

A COMPLETE LINE OF



FOR THE MODELER

Answer to a Modelers Dreams

It's the New

Excitingly Realistic
in the Water

Fully Complete and Ready
for Easy Assembly.



TUGBOAT 27

Harbor Type Tugboat

Expertly Engineered and De-
signed for Multi-Channel or
Single Channel Radio Equip-
ment with Electric Power.

As Always Veco Includes
All Necessary Metal Fittings

Complete
Kit Only

\$18.95

27"
Long

• 37" Vacuum Formed 1/4" Styrene Hull

• Formed Pilot & Deckhouse, Smoke Stack,
Ventilator, Aft Cabin, Deck, Quarter-bits
& Steps

• All Metal Fittings are Provided

Propeller, Shafting Box, Brackets, Rudder,
Steering Arm, Searchlight, Running Lights
& Horns/Whistles

FOR THE MODELER

TUGBOAT 35
Ocean Going Type

Kit Price
\$24.95

Designed Specifically
for Radio Control
with Electric Power.



35" Overall Length

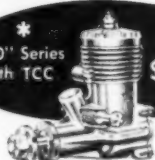
- ★ All Preform Styrene Parts.
- ★ 1/4" Vacuum Formed Hull.
- ★ Formed Pilot & Deckhouse, Smoke Stack,
Ventilator, Lifeboat, Aft Cabin & Slang.
- ★ Discut Plywood Planked Deck.

- ★ All Metal Fittings Provided. Propeller,
Shafting Box, Bell, Drivshaft, Rudder,
Whistle, Steering Arm, Searchlight and
Portholes.

For the Perfect Combination Buy Veco
Engines • Airplanes • Accessories

New "Veco .19"

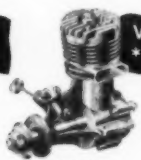
* "100" Series
with TCC Only
\$9.95



* With Temperature Controlled Clearance



\$14.95



\$14.95



\$14.95

Power for the 1955 National Stunt Champions

MUSTANG



\$7.95

A Semi-Scale U-Control Model for Stunt & Scale
Events. For Engines .19 to .35 Dis. Wing
span 48".

THUNDERBIRD



\$8.95

WINNER 1955 NATIONAL Open & Jr. Stunt.
Calif. Stunt Champion. Designed by Bob Palmer.
For Engines .19 to .35. Wing span 54".

TOM-TOM • COMANCHE



\$3.95

The Biggest Buy ... By Comparison in U-Control
Model Airplanes. Very Easy to Build. For
Engines .19 to .35. Wing span 40".



\$2.75

A Free-Flight PAA-Load Contest Model. A Terrific
Performer. Engines .049 to .075. Span 36".

SMOOTHIE



\$7.95

Bob Palmer's Contest Winning Stunter. Designed
for Windy Weather. For Engines .29 to .35.
Wing span 52".

The WARRIOR



\$4.95

A Realistic Pugged & Reliable Stunt Model, with
Flaps, that anyone can fly. Engines .19 to .35.
Wing span 37".

PAPOOSE • NAVAJO



\$3.95

A Baby Stunt Job with Full Flaps. Fly this one
for Fun or Fame. For Engines .15 to .19. Wing
span 32".



\$2.50

A Free-Flight Contest Winner for Navajo or Ex-
pert. Dethermalizer Equipped. For Engines .049
to .075. Wing span 36".

The CHIEF



\$6.95

A Beautiful, Thrilling, Super-Stunt Model. For
Engines .19 to .35. Wing span 54".

The REDSKIN



\$4.95

A real U-Control Beauty for Team Racing. Simple
Rapid Construction. Buy It Today ... Fly It To-
morrow. For Engines .19 to .31. Wing span 31".

TOMAHAWK • The SIOUX



\$2.95

The Biggest Buy ... By Comparison in U-Control
Profile Model Airplanes. For Engines .19 to .35.
Wing span 40".



\$2.75

An Almost Indestructible Free-Flight Sport Model
for Navajo or Expert. For Engines .049 to .075.
Wing span 36".

The SQUAW



\$5.75

A Terrific Responding Full Flap Stunter. For
Engines .19 to .35. Wing span 38".

The BRAVE



\$4.75

A Recommended Stunt Trainer for the Navajo.
Easy to Assemble & fly. For Engines .19 to .35.
Wing span 37".

TAYLOR CUB • DAKOTA



\$2.95

A Popular Free-Flight Scale Model of its Famous
Brother. Lightweight Construction. For Engines
.049 to .051. Wing span 35".



\$2.75

A Free-Flight Sport Bi-Plane of unusually Simple
Construction. For Engines .049 to .075. Wing
span 24".

The SCOUT



\$2.50

An Ideal Lightweight Stunt Trainer. A Perfect
Beginners' Model. For Engines .049 to .075.
Wing span 35".

If Unavailable At Your Local Hobby Dealers, Contact Veco Direct ... Veco Products Corp., Burbank, California

6

NEW MODELS FROM SCIENTIFIC

Now at your favorite hobby shop! These 6 sensational new models from SCIENTIFIC. They're simply terrific performers! Every one a super value! Here's modeling fun and thrills like you never dreamed possible . . . and for so little money!

E-Z TRAINER

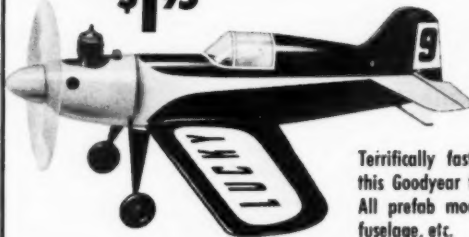
features
JET FIGHTER
styling



18" WINGSPAN
For Gas Engines
.039 to .074
Deluxe profile U-
Control model . . .
with a formed
bubble canopy.
All prefabbed.

\$129

\$195



LUCKY RACER

18" WINGSPAN
For Gas Engines
.039 to .074

Terrifically fast flying model of
this Goodyear type racing plane.
All prefab model with a carved
fuselage, etc.

Fast! Colorful!
E-Z to FLY!



An excellent all-around U-
Control flying model. All pre-
fabricated with a fully carved
balsa fuselage.

RED FLASH

18" WINGSPAN
For Gas Engine
.039 to .074

\$169

BEECH "BONANZA"



18" WINGSPAN
For Gas Engines
.039 to .074
An exciting
U-Control scale
flying model.
All prefabbed
with carved
fuselage, etc.

\$195

LARK SPEEDBOAT



ALIVE
WITH ACTION

\$250

20" LENGTH. 7" BEAM
New streamlined speedboat for any Out-
board Engine . . . gas or electric. Features
advanced "Waterama" bow design. All
prefabricated.

CESSNA 182 Tricycle



18" WINGSPAN
For Gas
Engines
.039 to .074

\$195

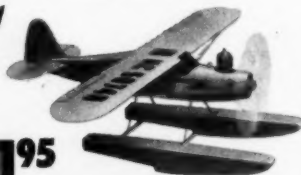
Brand New! U-Control
scale flying model of this
world famous plane. All pre-
fabricated with carved fuselage, etc.

2 MORE
HIT MODELS . . .
FROM SCIENTIFIC

PIPER SEA SCOUT

18" SPAN For .035 to .074 ENG.
Exciting fly-it-yourself seaplane! It's
U-Control . . . easy to fly and a cinch
to assemble from its fully carved
fuselage and all prefabbed parts.

\$195

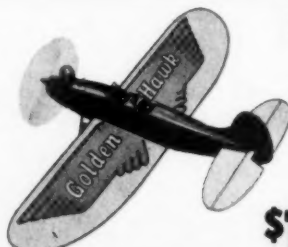


Terrific Fun!
TAKES OFF AND
LANDS ON WATER

GOLDEN HAWK

18" WINGSPAN
.035 to .074 ENG.
Extremely C-D-L-O-R-
F-U-L flying model
with a great big ex-
pansive wing. All pre-
fabbed with carved
fuselage, etc.

\$195



SEE YOUR DEALER
FOR ALL THE SCIENTIFIC

AIRPLANES • SPEEDBOATS • RACE CARS

SCIENTIFIC

SCIENTIFIC MODEL AIRPLANE COMPANY

113 M2 MONROE ST., NEWARK 5, N. J.

If no dealer is available, add 25c (postage & packing) to cost of model

OUT-OF-THIS-WORLD Model Values FROM SCIENTIFIC



STINSON RELIANT \$1.49
SPAN: 18" For .035 to .074 Eng.
Ground "pull" wings gives this U-Control model
great action. All prefab. Carved fuselage, etc.



F-94C "STARFIRE" \$1.69
SPAN: 18" For .035 to .074 Eng.
U-C model of this sensational 600 m.p.h. jet.
Flies like a dream. Prefabbed, carved fuselage.



Christ-Craft "HORNET" \$1.95
LENGTH: 18" For Any OUTBOARD Eng.
Real speed demon! Semi-scale with our new
"Waterama" design. All prefabbed. For R/C too.



NO. AMER. TEXAN AT6 \$1.99
SPAN: 18" For .035 to .074 Eng.
Our extremely popular scale model of the
AT6 Trainer. All prefab. Carved fuselage, etc.



EXPRESS CRUISER \$1.95
LENGTH: 18" For Any OUTBOARD Eng.
Chris-Craft cabin cruiser model (semi-scale) with
our new "Waterama" design. All prefab kit.



RED DEVIL \$1.49
SPAN: 18" For .035 to .074 Eng.
Terrifically colorful all around sport model.
Professionally built. All prefab.



TONY MASTER \$1.50
SPAN: 18" For .035 to .074 Eng.
In stock-and 1/4A stock plane over...
A modified scale of carved fuselage, etc.



MISTER MULLIGAN \$1.69
SPAN: 18" For .035 to .074 Eng.
Scale model of this famous trophy race champ.
U-Control. All prefab, w/curved fuselage, etc.



U.S.S. NAUTILUS \$1.99
18" Hull. Rubber Power Included.
Actually operates like a real sub. Submarine
hobbyists' favorite. Prefabbed, carved fuselage, etc.



PIPER TRI-PACER \$1.69
SPAN: 18" For .035 to .074 Eng.
Tricycle landing gear... safer landings on this
scale U-C model. It's prefab, a terrific flyer.



LITTLE IKE \$1.19
SPAN: 18" For .035 to .074 Eng.
Exciting U-Control model of this granddaddy of
'Goodyear Trophy Racers.' Super-prefab. Profile.



LITTLE STINKER \$2.99
SPAN: 16" For .035 to .074 Eng.
Bury Stinker's (Pitts) beautiful, championship
scale model. Highly detailed, all prefab model.



NO. AM. T-28 TRAINER \$1.19
SPAN: 18" For .035 to .074 Eng.
Fly-it-yourself version of U.S.A.F. training plane.
It's U-Control, a rugged profile flyer. Prefabbed!



EP-300 DREAM BOAT \$1.99
1/4A Eng., C.O., or Elec. Motors
See exclusive patent-pending design. Prefabbed
model has 14" curved fuselage, etc.



NO. 310 "CORSAIR" \$1.19
SPAN: 18" For .035 to .074 Eng.
Scale model of famous Corsair fighter. All prefab.
Carved fuselage, etc.



F-100 SUPER SABRE \$1.95
SPAN: 18" For .035 to .074 Eng.
Scale model of first U.S. supersonic jet
fighter. A terrific flyer. All prefabbed kit.



TORPEDO SPEEDBOAT \$2.99
LENGTH: 20" BEAM: 8"
Think your speedboat for OUTBOARD model.
Professionally built. All prefab.



LITTLE SPITFIRE \$1.19
SPAN: 18" For .035 to .074 Eng.
Fly-it-yourself version of famous hero of the
'Battle of Britain'. Profile U-Control. Pro-fab.



BEECHCRAFT "17" \$2.95
SPAN: 16" For .020 to .074 Eng.
U-Control, prefabbed model has curved balsa
fuselage, formed balsa wings, metal cowl, etc.



RIVIERA \$3.99
For 1/4A Eng. or Electric Motors
Authentic Christ-Craft quality with 18" curved
fuselage. All prefab. Carved fuselage, etc.



FIREBIRD RACE CAR \$1.89
LENGTH: 18" For .035 to .074 Eng.
Now, futuristic race car that speeds to 60 m.p.h.
It's prefabbed, 4 rubber wheels, curved body, etc.



BUCKEYE JR. \$3.99
LENGTH: 14" For .020 to .074 Eng.
A "zoom" of a speedster. Prefabbed with a
curved fuselage, etc.



BART SPEEDBOAT \$1.99
For 1/4A Engines .035 to .074
Minimum speedster, replica of U.S.N. Command
"Bart." All prefab model. Exciting to race!



LITTLE MERCURY \$1.50
SPAN: 18" For .035 to .074 Eng.
U-Control carved fuselage model. It's com-
pletely prefabbed. A cinch to assemble.



BUCKEYE JR. CABIN \$3.99
For 1/4A Eng. or Electric Motors
Here's our sleek cabin cruiser, with a room-
able cabin. 14" curved fuselage. All prefab.



LITTLE MUSTANG \$1.95
SPAN: 18" For .020 to .074 Eng.
Famous escort fighter model. Prefabbed. Fea-
tures carved balsa fuselage, formed balsa wing.

FREE!

Send for our new, colorful
1956 catalog. See your dealer
... or send a postal card.



SCIENTIFIC

SCIENTIFIC MODEL AIRPLANE COMPANY

113 M2 MONROE ST., NEWARK 5, N. J.

If no dealer is available, add 25c (postage & packing) to cost of model

OFFICIAL RESULTS of the

1956 NATIONAL MODEL AIRPLANE COMPETITION in Dallas

Regardless of claims, no other engines can show these recognized official results!

EVENTS	1ST PLACE		2ND PLACE		3RD PLACE	
	ENGINE	FUEL	ENGINE	FUEL	ENGINE	FUEL
1/2 A Speed Junior	Thermal Hopper	TD racing	Thermal Hopper	TD racing	Thermal Hopper	TD racing
1/2 A Speed Senior	Thermal Hopper	TD racing	Thermal Hopper	TD racing	Thermal Hopper	TD racing
1/2 A Speed Open		TD racing	Thermal Hopper		Thermal Hopper	TD racing
1/2 A Free Flight Junior	Thermal Hopper		Thermal Hopper	TD glow		
1/2 A Free Flight Senior			Thermal Hopper	TD glow		
1/2 A Free Flight Open						
PAA Clipper Cargo	Thermal Hopper	TD racing	Space Bug	TD racing	Thermal Hopper	
American class PAA load—Junior, Senior	Thermal Hopper		Thermal Hopper	TD racing		
American class PAA load open	Thermal Hopper	TD racing	Thermal Hopper	TD racing		
Free Flight ROW all classes, Senior	Thermal Hopper	TD racing				
ENGINES			THIMBLE DROME		ALL OTHER MAKES	
First places 1/2 A			6		3	
Second places 1/2 A			8		1	
First to Third 1/2 A			17		10	
Total first places			7			
FUEL			THIMBLE DROME		ALL OTHER MAKES	
First places in 1/2 A			5		4	
Second places in 1/2 A			7		2	
First to Third in 1/2 A			15		12	
Total first places			9			

Thimble Drome

Thimble Drome Engines also established 2 new speed records and a new Clipper Cargo record.

Where stamina counted—Thimble Drome did best

EVENT	TD ENGINES	TD FUEL
1. Speed	7 out of 9 places	7 out of 9 places
2. Clipper Cargo	all 3 places	2 out of 3 places
3. American class PAA load Junior, Senior	1st and 2nd places	2nd place

L. M. COX Manufacturing Company, Inc., P. O. Box 476, Santa Ana, California

mm. diameter, the Hungarian "Lactron" rubber being of this type and, seemingly comparable with flat type contest rubber used in Western countries.

The present F.A.I. record for model jet aircraft, as well as the official absolute world speed record for any type of model plane, is held by a Russian pulse-jet engine model, built by Ivan Ivannikov, with a speed of 275.004 km./hr. (170.8 mph). The Russians appear to have taken jets more seriously than their efforts in piston-engine speed models which lag far behind the McCoy and Dooling speeds of the U.S.

Ivannikov's model consists of a large pulse-jet engine with metal wings and tail unit attached directly to it and a short, fixed, offset landing gear. Specially developed for jets by Ivannikov, and used on this model, is a quite ingenious solution to the question of tank layout, which, of course, is so often a problem with this type of model. In this, the standard intake cowl is removed and a considerably lengthened cowl, with an integral central intake duct, takes its place. The annular space formed between the wall of the central duct and the cowl forms the tank. This is pressurized by means of a forward-facing tube which leads into the front part of the tank on the inner side relative to the flight circle. (The model flies clockwise.) On the outside is a "last-drop" feed bulge from which gasoline is fed to a vertical spraybar with three jets. Control of delivery rate is provided for by a simple screw adjustment inserted in the feed pipe.

General design of Russian pulse-jet motors follows that of the Dynajet, but usually they are much more bulky. A standard Russian design is the RAM-1 pulse-jet designed by Michael Vasilchen-

ko. It has the following specification: length 855 mm. (33.66 in.); maximum diameter 64 mm. (2.54 in.); tailpipe diameter 34 mm. (1.35 in.); operating frequency 150 c.p.s.; fuel consumption 1.5 gr./sec. (3.2 oz./min.); static thrust 1-1.5 gk. (2.2-3.3 lb.); dry weight 320 gr. (11.3 oz.).

From this it will be seen that this engine is half again as long as the Dynajet and, although considerably lighter in weight, has a lower overall efficiency on account of its lower pulse frequency.

Variations on the RAM-1 theme have been seen on models by Vasilchenko and Ivannikov, producing claimed thrust figures as high as 5% lb. but here the increase in performance has been obtained by increasing volume (e.g. 3 in. combustion chamber, 1.6 in. tailpipe) rather than the operating frequency, which seldom seems to be more than 160/180 c.p.s. Fuel consumption is the region of 7% oz./min.

An exception to this approach, however, was seen at the 1955 Moscow national meet in an enclosed-engine model by V. Kurakin which closely resembled the Czech Sladky's model that had won in Moscow the previous year. It has a high-frequency unit of approximately Dynajet size (20.1 in. long, 2% in. combustion chamber, 1% in. tailpipe) and was probably inspired by the Letmo unit used by Sladky which, itself, is essentially Dynajet in conception.

Russian free-flight gas models largely follow the normal pylon layout. The standard contest class is the F.A.I. "International" formula, i.e., motor not exceeding 2.5 c.c. (.152 cu. in.), a power loading of not less than 7.06 oz./c.c. and a total surface (wing plus stab) loading of 3.93 oz./sq. ft. minimum. Tendency is towards the maximum area permitted under these

rules. A tip-up stab dethermalizer, operated by the usual fuse, is standard equipment, the fin generally being positioned on the fuselage forward of the stab leading edge—a layout which is also used by the rubber enthusiasts.

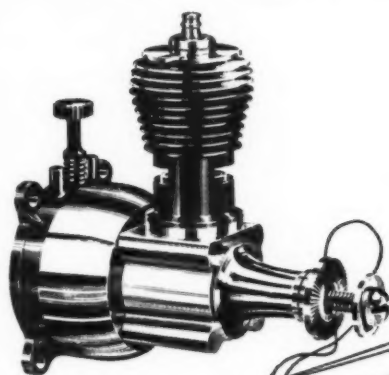
The recognized F.A.I. contest class (Nordic A2) has also been adopted in the case of towline sailplanes. As we have said, the Russians do not appear to be up to the best International standards in this category, but doubtless they will improve when faced with such opposition as is provided by Germany and the Scandinavian countries in the A2 class and can witness the highly developed technique of the leading exponents of these countries.

Radio-controlled models have been built in the Soviet Union for a number of years and RC endurance records have, from time to time, been established, the present world duration record for power driven models being, in fact, held by a Russian, Peter Velichkovsky, with a time of 3 hr. 6 min. 38 sec. He used a large shoulder-wing ship fitted with two-channel equipment of his own construction. Radio-control is practised by only a very small minority of modelers in Russia, however, and no ready-made equipment appears to be available at the present time.

In conclusion, we would say that there is every indication that the appearance of the Russians on the international modeling scene, marks a turning point in the development of the hobby in the Soviet Union. Possibly it will never resemble the hobby as it is known in America, with its constantly expanding variety of equipment and innumerable other developments, but there is little doubt that closer contact with Western ideas will be of benefit to Russia's model builders as a whole.

for **CONSISTENT RESULTS** every day in SPEED OR SPORT... IN PLANES, BOATS OR CARS

Be sure you're...



Thimble Dome FUEL

TD fuel will give you superior performance in any engine. Always use it with a TD engine



Powered by Thimble Drome

You don't have to be told you've got the finest power plant when you're using a Thimble Drome. You can tell—by the way your engine starts, by the snarl of authority of a TD engine, by the way it mounts up to peak power without a stutter, and as time goes on, by the way it lasts. And because Thimble Drome engines are the most popular half-A engines in the world, they give you more for your money—in features, design improvements, precision engineering, and highest quality, durable metals. In your own model and in any ready-powered model, make sure the power is a championship TD engine.

L. M. COX MANUFACTURING COMPANY, INC.

P. O. Box 476 • Santa Ana, California

Radio Control News

(Continued from page 31)

and in Mickey Mouse, or single channel, it was Vic Nelson, Bill Amour and Joe Murphy. One feature of the contest was the try for the greatest number of points for precision flying during the two-day meet. Jerry Slovacek, with 611 points, nosed out Bill Williams at the last minute by 17 points.

We took our Cheryl Ann tug, equipped with the new Babcock 465mc receiver, out for a run and ended up giving it a distance check, since we happened to have a large lake and a rowboat. Might as well have left the boat tied up since the equipment functioned perfectly at a distance of over 600 feet, the transmitter being held about 24" off the ground. At this point we had to be signaled that the boat was headed back towards shore, since it was a mere speck in the water. While we highly recommend that you follow the manufacturer's specifications when making any RC installation, we were forced to do a hurry up job of installing the receiver and antenna in a new cabin and deck unit. This installation placed the antenna on the ceiling of the deck house and the receiver was placed directly on top of it, the receiver lying on its side and separated from the antenna by a 3/16" thick piece of plastic foam. Three hours of almost continuous running failed to show up a single missed pulse. A deBolt 3PN servo was used for rudder control and a Distler Aristo-Revo motor was the main driving power.

From Miles Wilson, W7AIR of Helena, Mont., comes news that his 3-channel CG transistorized reed equipment is working out very well. He also has one of the old 112" Cavalier planes (made famous by Berkeley in the '30's.) which seems to fly

about the same, whether at 10 pounds or 13 pounds.

While possibly coming under the heading of New Items or Technical Topics, we thought that a brief mention of a new German receiver, designed by Radio-Rim of Munich, would be of interest. This very compact unit uses a DL87 tube for the detector, followed by two transformer coupled transistor amplifiers. A 400 cps tone modulates the 1/2 watt transmitter needed to operate the receiver. The novel feature of the receiver is in the use of but a 6-volt battery for the power requirements. What about the high voltage on the plate of the tube? A transistor power converter, similar to that given in an earlier issue of this column, is used. Current drain from the 6v source, with no signal is 15ma, rising to 40ma with a signal. The power converter puts out 25v at .4ma. Quite clever and novel to say the least.

Now that the Babcock 465 equipment is gaining in popularity, and since the antenna and detector circuit is separate from the balance of the receiver, users have wondered about making their own antenna and detector circuits. The antenna appears to be nothing more than "a rag, a bone and a hank of hair." However, the type of diode used is not readily available on the open market and the more commonly used diodes (for general RC work) will not work. For the time being, it would be much easier to purchase another antenna unit from Babcock.

More and more RC users are turning to the B & S Products Co., (Box 135, Mercer Island, Wash.) Transistor Power Converter, now being produced in 30v, 4-5ma; 45v, 4ma; and 67v, 8ma sizes. These units have been checked out on practically all commercially built receivers. However, slight changes in the installation hookup are some-

times required for particular receivers. It is recommended that the WAG receiver use a separate filament battery so that A plus and B minus can be tied together. A DPST switch may be used to break connections. For those of you using the power converter with a CG reed receiver, a 22k 1/2w resistor is connected between B plus on the receiver and the B plus terminal of the power unit. One side of a DPST switch is connected across the 22k resistor and the other half of the DPST switch is connected in the filament circuit of the receiver. A SPST switch is used in the A plus lead of the power converter. In operation, it is necessary to close the SPST switch to the power converter first, leaving the DPST switch in the OFF position for a few seconds and then closing it. This is necessary due to the 3mfd capacitor placed in the receiver between B plus and B minus. If the 22k resistor is not used or if the DPST switch is closed when the converter is switched on, the current surge which charges the 3mfd capacitor may overload the converter. These converter units can be classed as one of the really new innovations in RC work for the past year.

From Dr. W. A. Good of the AMA-RC Committee, comes a notice regarding the manner in which various "designers," and we use the term loosely, are modulating their transmitters. This consists of employing a buzzer which operates directly into the grid of the oscillator tube. Come now gentlemen, surely you can do better than this. Did you know that a buzzer produces an arc, which for this purpose, cannot be effectively filtered to the point of keeping within plus or minus 25kc of 27.255mc. The FCC is quick to ferret out such cases, which could result in drastic curtailments of our frequencies.

Fig. 1 gives the audio modulation cir-

GET STARTED RIGHT

WITH DELTRON R/C EQUIPMENT

Whether you're a contest flyer, or new to R/C, you'll want attributes of proven dependability, ultra sensitivity, light weight and small size.

You get all these features, and many more when you buy DELTRON.

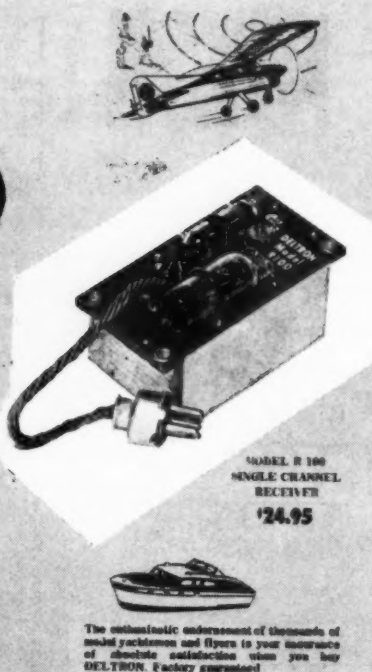
Built with highest grade components, the DELTRON is featherweight, compact and extremely sensitive. With its outboard relay and rugged construction, it is virtually crash proof.

Low current drain makes the use of sub-miniature batteries possible, saving additional space and weight, which contributes to low wing loading, so necessary for successful R/C flyers.

DELTRON receivers require no "C" batteries and are not critical to antenna length. They're not affected by outside noise from motor or escapement.

**Don't settle for less than the BEST
when you buy an R/C receiver**

ASK YOUR HOBBY DEALER ABOUT DELTRON



MODEL R 100
SINGLE CHANNEL
RECEIVER
\$24.95

The enthusiastic endorsement of thousands of model yachtsmen and flyers is your assurance of absolute satisfaction when you buy DELTRON. Factory guaranteed.

cuit, which is the companion of the regulated power supply described last month. Fred Mann, 37 Cartwright Avenue, Sidney, N.Y., submitted the circuit for reed equipment use. This circuit is perhaps one of the most stable that can be devised. Return of the grid resistors to B plus instead of to ground and the 4700 ohm resistor in the B plus lead are the determining factors. Since grid modulation of our MOPA transmitter is used, a low value of plate voltage can be used on the 304 tubes. The audio tuning pots are of the dual type, since each resistance leg must be varied a like amount. The high value of 2 megohms will allow an audio tone to be generated which is below 100 cps. For general work 1 megohm pots will cover the range of most reed banks. As many sets of pots and 200k resistors may be used as required; two are shown. No details are given on the control box, however, switching in of the dual pots must be done by a double pole switch. A little brainwork should enable you to build a suitable control box, utilizing a Lord mount for a universal on the stick, or springs could be used for centering the stick.

This month we shall give the beginner to RC a resume of multi-channel RC equipment. However, we wish to point out again, that the beginner should not be talked into buying a multi-channel piece of equipment for his first crack at RC. That is, unless he has a flush wallet and a sense of persever-

ance. Manufacturers can make these units practically foolproof but not darnfool proof. At the present time, there are three basic methods for obtaining multi-channel operation on a given carrier frequency. These are reeds, tuned filters and various forms of tuned relays or discriminator circuits. At present, the reeds are enjoying a high degree of popularity and there are a number of reliable manufacturers of same throughout the country. A reed unit can give you from 2 to 6 channels per reed bank and this system is the only one whereby you can operate one reed or a dozen reeds with no increase in the number of tubes or associated components. It does require a bit of understanding to obtain proper operation from reed equipment. Great strides have been made in the past year in the design of audio circuits so that once you have become familiar with receivers and transmitters, in general, you should have no trouble getting into reed equipment. All of the manufacturers employ tubes throughout in their receivers, except CG electronics, who use two transistors and one subminiature tube.

One of the oldest manufacturers of reed equipment, and actuators, is Schmidt Radio Controls, 350 East 33rd St., Erie, Pa. This is 5-channel equipment, very well designed and used with excellent results by a large number of RC flyers.

The Badaco Mfg. Co., 2801 Penick Street, Shreveport, La. markets a 3 and 5-

channel reed unit. The novel features of this equipment being: receiver packaged in a space 3" x 3" x 2 1/2", completely enclosed in an aluminum box; use of their regular carrier or straight tone transmitter for multi-channel reed work; a reed unit control box having built in voltage regulation; complete waterproofing of the receiver for marine operation.

CG Electronics Corp., 305 Dallas St., N.E., Albuquerque, New Mex., was the first manufacturer on the market with transistorized reed equipment and the units may be had in from 2 to 5 channels. This is the equipment which won the multi-channel event at the '56 Nationals. Lightweight and the lowest filament drain of any unit are the important features. This equipment has been well proven in the field and under tough competition in contests. Buy either the ready built and factory tested units or a set of parts for assembling your own receiver. The 5-channel transmitter, which is hand held, has a regular stick for control and is highly stabilized for reliable operation. Photos show the 2-channel receiver and the transmitter, which can be converted to 3-channel operation by inserting the modulator unit shown at the bottom.

Another 5-channel reed outfit is manufactured by Bramco Products, Pleasant Ridge, Mich. One might call this 'just another reed job' except for the fact that this unit claims a reed bank which has at least a 5 cycle margin, with the low frequencies being up to 10 cycles spread. This means more reliability and a greater tolerance for drifting of the audio tone in the transmitter. For those desiring the ultimate in performance and appearance, Bramco builds a Gold Chip Special. All contacts in the reed bank and the relays are gold plated for minimum contact resistance and tarnish-free surfaces. Actuators are also available from this company.

The above was a general resume of reed receivers, pointing out a few of the pertinent points on each unit. There are others on the market and your local hobby dealer can advise you as to the availability of them. The above equipment is on 27mc.

Tuned filter receivers for multi-channel work are under the sole manufacture of Babcock Models, Inc., Box 3134, Van Nuys, California. This equipment is as foolproof in operation as anyone could want, especially the 465mc equipment which has no tuning controls of any kind. The 2-channel transistorized 465mc receiver requires but one 30v hearing aid battery and it is ready for operation. The main feature of this particular 2-channel unit is that both channels can be operated simultaneously. Babcock also produces a 3-channel unit for use on 27.255mc. This is a tube version receiver which has won wide acclaim for its reliability in the hands of the newcomer as well as the expert. This unit is shown in a photo, along with accessory, actuators and instal-



**Most
Complete
Book
on
Model
Motors!**

228 pages, 6x9". Beautifully bound
in cloth and gold-stamped \$2.00

AIR AGE INC. 551 Fifth Ave., New York 17, N. Y.

AVIATION HISTORY! SCALE MODEL DRAWINGS!

U.S. ARMY - U.S. AIR FORCE FIGHTER PLANES



P-1
TO
F-100

First book of its kind, devoted exclusively to scale drawings of U. S. Army and U. S. Air Force pursuit and fighter planes. Fifty-four highly detailed three-view scale drawings present progress of U. S. fighter planes from the Curtiss P-1 "Hawk" of 1925 to the F-100 "Super Sabre" of today. Superb three-views include specifications, performance and armament data, and authentic color schemes for each model. A must for scale model builders, and those interested in historical aviation.

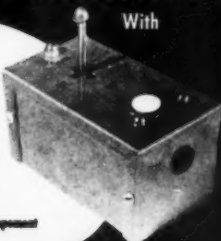
Price: \$1.50 Postpaid

EDWARD J. FARLEY, Publisher
P. O. Box 7123 Jacksonville 10, Florida

PILOT CONTROL!

Rapitrol Stick-Box

Only \$13.95
For the finest in
precision control,
use "RAPITROL" the
stick-box designed to
control the



Multi-Compound
Equipment Only \$11.95

Multi-Compound

The Flying Partner of the
Rapitrol Stick Box.
Automatically Synchronizes
with Stick Box.

Provides Complete Rudder,
Elevator & Motor Control.

Both
Equipment
and Stick-Box
Combinations
\$24.95

ELECTRON PRODUCTS CO.

P. O. Box 393 Smyrna, Ga.

Don't Forget the Most Reliable Battery
Boxes With Live Spring Contacts!

Positive Type
4 Medium Cell Size 95¢
4 Pennell Size 75¢

Multipac Type
Holds (4) Pennells & (2) 22 V.
or (4) Pennells & (3) 22 V. \$1.65

lation kit. Either Babcock unit (27mc or 465mc) is the ultimate in engineering and operational reliability.

A recent entry by Citizenship Radio Corp., Indianapolis, Ind., into multi-channel sets, has produced the 2-channel unit which was described in the November issue of MAN. This is a tuned relay type of unit which is very compact and assures you of the same degree of performance as that obtained with the Citizenship 27 and 465mc single-channel receivers. The hand-held transmitter is fix-tuned on the audio frequencies, as is the receiver. This ready built 2-channel unit should gain in popularity in 1957. The staff is planning an airplane project around this Dual Channel equipment.

Next month we'll clean up this outline of equipment, aimed at helping the newcomer choose his receiver, transmitter and accessories.

Stratoliner

(Continued from page 24)

Flying: Of first importance is a set of strong, light and thin control lines. Four pounds test nylon fishing line was found to be ideal by the author, although its stretchiness necessitates the use of a larger than average control handle. With very stretchy lines, as much as 18 in. line spacing may be necessary, in order to have good maneuverability.

Make your first flight on 75 to 100 feet of line, to allow yourself to become accustomed to flying on longer lines, and to the handling of the model. Any climbing or diving tendency should be corrected by warping appropriate incidence into the stabilizer. It is best to fly over grass, as the model reaches a tremendous speed in long dives on 200 foot lines, and a crash on pavement would be quite disastrous. After you have felt out the model, you will find stunting a lot of fun. Huge vertical eights, for example, are a joy to behold. All in all, Strato-Liner is a model having very good flying qualities, and is quite out of the rut.

Guardian in Styrofoam

(Continued from page 12)

three formers: the tail piece, firewall, and Number 2 former that holds the landing gear wire. From the Number 2 former back to the tail piece is solid Styrofoam, covered with 1/32 balsa sheeting. This 1/32 balsa is very easy to work with. When wet, it can pretty nearly be tied into a knot without fear of splitting and, when cemented to Styrofoam with Silkspar covering, makes a very good foundation for smooth painting. For flying scale fans wishing a superb finish, I suggest using the 1/16 soft balsa covering in place of the 1/32; this will give you a good sanding surface that, when covered with Silkspar and painted, will have a very hard surface that will take a perfect compounding job.

Most modelers I meet ask, what is Styrofoam? Styrofoam is made by the Dow Chemical Co. It is a polystyrene rigid plastic expanded 40 times. It is 30 times lighter than water, five times lighter than balsa wood, will stand temperatures from subzero to 175°F. without losing its original shape. Since there is no capillary action, this material will not absorb water. A piece 2 x 12 x 36 weighs only 12 ounces. Dopes or any acetate cements cannot be used directly on Styrofoam. This is where the 1/32 balsa sheeting protects it from the strong paints and cements. There are over 20 brands of cements and glues that can be used directly on Styrofoam without fear of disforming or melting. (List

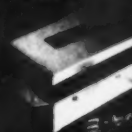
HERE'S the MIGHTY CHARLEY C.G.



The Nationals' R C Equipment Winner

You can be a champion, too! Install CG's award-winning FIVE CHANNEL T-5 transmitter and matching RT-5 receiver, which feature . . . complete pretesting before shipment . . . easy installation with no complicated adjustments.

RT-5 FIVE CHANNEL TRANSISTORIZED RECEIVER \$119.50



- Carrier Frequency: 27.255 mc. (tunable)
- Audio Frequency: 250-400 cps. (fixed)
- Lightweight: 8 1/2 oz. with batteries
- Measures 2" x 3" x 2 1/4"

T-5 FIVE CHANNEL TRANSMITTER \$89.95



- Crystal Controlled: 27.255 mc.
- Stick Type Control
- Lightweight: 4 lbs. with batteries

Free

Send for free CG Catalogue containing full specifications on entire R. C. line including money saving, easy to assemble, do it your self kits



ORDER NOW FROM YOUR
DEALER OR WRITE TO:

CG ELECTRONICS CORPORATION

Dept. 751 305 DALLAS STREET, NE
ALBUQUERQUE, NEW MEXICO

NEW R/C ITEMS!

★ Magnalux Wet Cell

Manufactured for a filament type cigarette lighter, these small wet cells are ideally suited for R/C. Weight is less than 1 oz. Size is 3/8" x 1 1/16 x 1 3/8". 1.8 volt. Will charge themselves up to 25 times with out external charge. Fine for filament, servo and other low drain uses. Written up in the R/C Channel Chatter column. May be charged using Ace Dry Battery Rejuvenator or other trickle- or low MA--charger, for much longer life. Case is sturdy plastic and leak proof. Get several at this low price of only, 75¢ ea.

★ Data Service Sheets

In keeping with our policy of bringing you the newest improvements in design, here are two new Data Service Sheets— 10¢ ea.

SS99—Galloping Ghost Actuator. For those who want Dual Proportional Control, but lack the skill to build the new WAG system, here is an answer using a Mighty Midget Motor as an actuator for both rudder and elevator. System is simplest available and may be used with a WAG SV4 or LAG4 pulser. Experts praise it.

SS10—Pulse Motor Control. Add motor control to your present pulse receiver, or to any other system including the dual one above. Requires addition of tube to present receiver—Loxren, Mac Single, CB, MC, Commander, etc.—When pulsing is stopped, relay actuates motor control escapement. Ultra simple—reliable.

Hundreds of values in our 28 page illustrated catalog. Write for 57-1M. It's FREE.

Ace Radio Control

Box 301
Higginville, Mo.

Ace R C East

Box 1681
Burlington, N. C.

Ace R C West

Box 18
Carmichael, Calif.



at end of article.) Tensile strength is as high as 65 pounds per square inch. Styrofoam can be planed, sawed, or cut into fine strips, using a sharp knife. A bread-knife will do as good a job as any. There is no grain, so no worry about splitting.

Where can you get it? Well, the best place I know is your local florist. If he doesn't have any handy, he can tell you where the florist supply house is; they will have plenty on hand and the price works out at about 1/6th the price of balsa wood. I used the green-colored Styrofoam because of the need to take photographs. The white Styrofoam seems to have a finer texture, resulting in a harder finish surface. Get three pieces of the White Styrofoam, 2 x 12 x 36. This will leave you enough to experiment with on a smaller sport plane. Let's start building.

As always, study the plan carefully. Get to know the layout thoroughly before starting. Obtain a Berkeley Guardian canopy and cowling. Cut to full wing size, two pieces of Styrofoam, 7 x 9 1/2 x 21 1/2 long. Trim down to the airfoil with long blade knife, then finish with coarse sandpaper for the first stage (leave 1/2" over size). Make the airfoil similar to the one shown on profile plan. At the thin ends, always sand (strokes) in toward heavier section (middle) with medium grade first, then fine grade sandpaper.

Make up main spar, using two pieces 1/2 x 1 1/2 x 21 1/2 long (taper at ends) medium hard balsa, jointed at the center with a piece of 1/2 plywood overlapping center joint 6" on each side. Cut out center of spar for bellcrank movement, install bellcrank plate, double cementing all contact points as well. Cement a small 1/2 balsa block under bellcrank plate for extra strength. Cut to size a medium hard piece of balsa 1/2 x 1/2 x 21 1/2 for the leading edge;

also a piece 1/2 x 1/2 x 21-5/16 for the trailing edge. Rough shape pieces to form a wedge. Now mark off leading and trailing edges of the Styrofoam. Cut Styrofoam edges off. Now cut wing where spar is to go, lay Styrofoam against spar, and cut out where bellcrank is to allow room for movement. Now cement Styrofoam (front and back pieces) to wing spar, also cement leading and trailing edges in proper place.

Square off wing tips and cement a piece of medium hard balsa 1/2 x 1/2 x 7" roughly shaped to wing tips. At center joints of leading and trailing edges, cement a small cross block of hard balsa, bind all pieces together with masking tape, and let set overnight. Layout wing slots as per plan and cut them into top of wing, then cover slot with Styrofoam sliced 1/16 wider than wing slots. Suggest, while cementing in top of slot, you lay a piece of 1/2 wire in wing slot; this will keep a 1/2 hole open for the lead in wires. The 1/2 wire can be removed as soon as the cement starts to set in 5-10 minutes.

Layout fuselage as shown on profile drawing, using a piece of medium hard balsa 3/16 x 5 1/2 x 26". On original crutch, I used lightening holes (note picture). Because of the extra hard balsa used in this plane, lightening holes are not recommended when using 3/16 thick balsa.

Mark off on each side of crutch where Number 2 former is to go (4 1/2" back from firewall) cutout wing slot as per plan, also cutout where third line bellcrank (quadrant) is to go. Scribe a 1 1/2" circle where arrester-hook hinge is to go. Cut out front half only, leaving the back part for a stop when hook is in lowered position. Make up the three formers (tail piece, Number 2 former—which is cut in half—and the solid firewall). Double-cement

34 Hrs. 34 Mins.



A NEW ENDURANCE RECORD. WHAT A RECORD! THE DIFFERENCE IS GOLD SEAL 200

Congratulations to Keith Lynn, Dick Williams, Phil Garrard, and Charley Burnett who, with the use of GOLD SEAL 200 and a Johnson "35" added 10 hours and 19 minutes to the former record.

Inspection revealed that GOLD SEAL 200 left absolutely no varnish or gum deposits — the engine was as clean as at the time of its take-off.

GOLD SEAL 200 . . .

- Delivers peak efficiency in hot or cool, dry or wet weather.
- Added inhibitor prevents varnish or gum deposits.
- Balanced blending provides perfect lubrication to protect your motor.
- Latest filtering* methods remove all foreign particles.

This is the same GOLD SEAL that you can buy in your local model and hobby shop. Treat your engine right — fill it with GOLD SEAL

* Filter system same specifications as that used by the USAF for jet and other aircraft fuels.

OHLSSON MANUFACTURING CO.

LONG BEACH, CALIF.

Not connected with Ohlsson & Rice

Shown with GOLD SEAL 200 used in flight is Dick Grimm, a crewman who assisted in refueling.



America's most popular Gas Models

U-CONTROL BASIC

Guillow's TRAINERS

KIT GM-14

PROFILE TRAINER I

24 inch wing span model for engines from .049 to .099 cu. inch displacement.

All parts, including air foiled balsa wing, ready shaped for quick assembly. Large tube of ambroid cement and complete hardware package in kit. (Engine not included.)

only \$3.25

Buy at your nearest model store or send direct to us adding 25¢ to all mail orders

**GM-4
PROFILE
TRAINER II**
for engines from
.14 to .19 **\$4.50**

**GM-15
PROFILE
TRAINER III**
for engines from
.19 to .36 **\$5.95**

PAUL K.

Guillow

INC.

WAKEFIELD, MASS.

these formers in place. Make up two 2" disks out of 1/16 plywood for hinge cover; advise using 1/16 spacers between this cover and crutch to give about 3/8" wide slot. This is enough room to make two turns on the 3/8 hook wire, leaving the short end 3/8" long. This will butt against crutch stop when in proper lowered position (prevents hook from swinging too far forward).

Make up third line bellcrank mount out of 3/8 plywood cemented in place. Also cement 3/8" block under plate for extra strength. Use a small Perfect bellcrank cut to shape as shown. Drill a 1/16 hole in Number 2 former and firewall 1/8" from center line and 3/8" below motor mount. Cement a 3/8" long brass tube for flap control wire to travel in, using a piece of 1/16 steel wire 5" long at front end for spring pressure control. Spring should be made up of .015 wire, open wound 2 3/4" long before contracting. Drill a 1/16 hole 1/8" from center line (Number 2 former and firewall), 3/8" from bottom of motor mount (right side). Cement in a piece of brass tubing 3/8" long in which the motor control rod (1/16 wire) travels. Check plans closely here. Cut tail section of crutch where stabilizer is to go. Be sure you cut this parallel to thrust line.

Cement a 3/8 x 1 3/8 x 3" wedge shape platform on crutch. Cement in place 3/8 x 3/8 x 9/16" hard (straight grained) maple motor mounts. Drill 3/8 holes for landing gear. Cut away crutch from top down to bottom line of motor mounts (between Number 2 former and firewall). Install landing gear made up from 5/32 steel wire. Make up fuel tank from tin stock (.010 thick) 4 1/2 x 2 1/2 x 1 1/2 wide. This will hold about 5 ounces of fuel. Cement tank in between motor mounts. Because top of the tank is one inch higher (for perfect engine run) do not put fuel into tank

until ready to take off as some fuel may drain into the venturi. The exhaust stack valve is made up from 3/8 x 2 1/2 long brass rod; one end is turned to 3/32 x 3/8 long, the other end to be 3/32 x 1" long. File on each side of rod till you have a 3/8 thick flat surface, this to be snug fit in exhaust stack. Also file away center part so valve will have clearance to turn. Make up side brackets out of 3/8 thick aluminum, using 4-40 bolts to hold in place. Control arm is also made of solid aluminum, 3/8 thick. Drill and tap a 4-40 hole directly over end of exhaust. This is for set screw to keep control arm in proper position. The venturi is made out of 1/16 brass wrapped around end of rod and locked in place with a 4-40 bolt. This venturi flap is closed when exhaust valve is closed, thus, when engine is running at slow speed for any length of time, the motor will not lose suction. The fuel will be right there when needed to pull out of the tight spots some of these carrier planes seem to get into.

Place motor in proper place (4-40 bolts), now install lower control quadrant and install spring to hold exhaust valve in open position. To overcome heavy air drag on third line, I suggest trying a piece of thread (light), tied from wing eyelet to wire clip; this will hold valve in open position until the first pull on the third line, which will automatically break thread.

Let's go back and finish covering the wing. Finish shaping and sanding with fine sandpaper then smear glue on wood. Cover with 1/32 (or 1/16) balsa sheeting. Let this set while making up rear stabilizer elevator, and rudder. Take measurements off plans. Install stabilizer and elevator as shown, using a 1/16 wire for the pushrod. Gouge out the tail block for the rudder post (3/8 sq.), to be inserted down one inch from the top. Now cement the tail block

Whether you are a beginner or a seasoned expert, Guillow now has a trainer, designed by Lou Andrews, famous control line champion, specifically suited for your skill and experience. Each model has been field tested for performance and durability. Visit your local hobby dealer and examine these kits. We know you'll be pleased with our products.

What Do You Fly?

**FREE-FLITE
STUNT COMBAT
SPEED
R. C.**

Tornado
**PROPELLER
MADE FOR JUST
THAT PURPOSE!**

FUEL
PROOF

HEAT
PROOF

**GRISH BROTHERS
ST. JOHN 1. INDIANA**

CLEVELAND

"SF" SERIES 3/4" SCALE MODEL KITS NOW CUSTOM MADE IN SMALL QUANTITIES

These are the same World Famous Cleveland Designed "SF" Master Kits you have heard so much about, made up the same as they were in the past. Kits include authentic full size well detailed plans, printed out (not drawn) parts on balsa, birchwood, special blocks, tissue, wire, wheels, label insignia, etc. (No cement, dopes or rubber bands included)

Drawings used in these kits are taken from the private historical record files of "Cleveland Model" and most of them have actually been printed 10 to 25 years ago. This is the reason for the country of kits — they are real "collectors' items" for scale model fans.



GREAT LAKES SPORT TRAINER

3/4" SCALE "SF" SERIES KITS AVAILABLE:

No.	NAME AND WING SPAN	Price
SF-1	Great Lakes Sport Trainer 20"	\$2.80
SF-3	17 DeHavilland 4 W.W. I. Biplane 31-7/8"	4.95
SF-4	17 Curtiss 266-0 W.W. I. Biplane 22-3/4"	4.75

SF-9	18 British SE-5 Scaphoon W.W. I. Fighter 30"	2.95
SF-13	17 S.P.A.D. VIII W.W. I. Fighter 19"	3.50
SF-15	17 Fokker 37 W.W. I. Fighter 19"	3.50
SF-17	31 Lowell Boyles "Goshawk" T.T. Biplane 17-3/4"	4.50
SF-18	Howard's "Pete" No. 37 Biplane 15"	2.95
SF-19	31 Br. Supermarine SE-5 Scaphoon Biplane 22-1/2"	2.95
SF-21	Army Curtiss "Waco" P-63 Biplane 22-3/8"	4.95
SF-29	Navy Seabee Fighter P-48-3 or 4 22-1/2"	3.95
SF-34	18 Fokker 18 "Flying Boomer" Fighter 20-3/4"	3.50
SF-41	Heavy Curtiss W-8 Corsair Biplane 26-7/8"	3.95
SF-42	31 Douglas O-38 Observation Biplane 30"	3.95
SF-44	Pope's Navy Curtiss High-Wing Biplane 23-5/8"	4.50
SF-46	28 Laird "Salmon" T.T. Biplane 15-7/8"	3.50
SF-47	28 Woodell's Woodell-Wing T.T. Biplane 19-1/2"	3.95
SF-48	24 Turner's Woodell-Wing T.T. Biplane 19-1/2"	3.95
SF-49	21 Curtiss FHC-2 "Goshawk" Biplane 22-3/8"	4.95
SF-51	31 "W. Halligan" T.T. Biplane 23-1/2"	4.50
SF-60	Army Seabee P-36-4 Low-Wing Fighter 31"	4.95
SF-63	26 French Condor T.T. Biplane 16-5/8"	3.50
SF-71	27 King's "Falcon" "Special" T.T. Biplane 19"	3.50
SF-72	28 or 29 Turner's "Pace Special" 18-3/4"	4.75
SF-74	German Haco-Haco ME-109 Fighter 24-1/2"	3.95
SF-75	Navy Grumman Twin-Motored "Skyraider" 21-7/8"	4.50
SF-77	Curtiss P-40 "Warhawk" Fighter 26-1/8"	4.35
SF-81	P-47 "Thunderbolt" Fighter 30-3/4"	3.95
SF-82	German Focke-Wulf 190 Fighter 33-3/4"	4.50
SF-83	P-38 Twin-Engine Lockheed "Lightning" 28-3/4"	4.95
SF-86	Jap Mitsubishi "Zero" Fighter 29-3/4"	4.50
SF-88	Republic "Boacker" Amphibian 28"	4.75
SF-89	Lockheed Jet P-80 "Starfighter" 29-1/4"	4.95
SF-93	Lockheed "Hudson" Light Bomber 49-3/8"	9.95
SF-97	Navy Grumman F4F "Wildcat" Fighter 31-3/4"	3.95
SF-100	Boeing B-17 "Flying Fortress" Bomber 72"	17.50

SF-108	Beechcraft "Bonanza" Personal Plane 35-1/4"	2.95
SF-115	Douglas A-20 "Neville" Attack Bomber 46"	10.95
SF-125	M.A. B-25 "Mitchell" Twin-Engine Bomber 48"	11.95
SF-135	Marin B-26 "Marauder" Bomber 48-3/4"	11.95
SF-145	Dr. D.H. Twin-Engine "Mosquito" Bomber 40-3/4"	7.50
SF-150	War. P-61 "Black Widow" Night Fighter 49-1/2"	14.95
SF-165	DeSinger B-23 or C-47 Transport 70-3/4"	17.50

We cannot guarantee to have all kits in stock, because many kits will not be manufactured again until they are sold. To be sure to get the kits you want —

ORDER YOUR FAVORITES TODAY!



SUPERMARINE S.B. RACER

ORDER BY MAIL — Minimum Order \$3.50

We sure to add 10% extra for packing & postage. Any overpayments refunded. Foreign customers add 20% (Gleason only, add 2% for Sales Tax. — SEND US FOR LATEST CATALOG.

CLEVELAND MODEL & SUPPLY CO., 4513B1 Lorain Ave., Cleveland 2, Ohio. WORLD'S FINEST MODELS — SINCE 1919

to tail former. Drill hole for brass tubing that hook release wire travels through; also cut out tail block where tail wheel plate goes. Cut a 3/4 piece of 1/16 wire, cementing 1/4 of it to rear of rudder, and then wrap nylon over wire. Double cement it. The balance of the wire hangs down and rests against the release wire.

Now finish sanding main wing and install. Connect pushrods for hook and elevator—hook to drop on full down elevator. Use a 1/32 flexible wire to connect arrester hook to flaps, also spring control on flaps. Cement 1/4 balsa planking to the front section from Number 2 former to the firewall. Cut and fit two Styrofoam side pieces. Before you cement in place, be sure all controls work perfectly, also that hinge pin is double cemented so it won't slide out. Cement Styrofoam side pieces in place, using masking tape to hold together while cement dries. When dry, sand to final shape, then cover with 1/32 balsa. Smear the cement over entire under surface of the wood, also wrap this with masking tape till dry. Then give fuselage two coats of clear dope. Lightly sand this off, then cover with Silkspar. Cut and shape the Berkeley canopy and fit cowl

in place when ready.

I've shown one type of plane that Styrofoam is used on. Since December, 1954, I have experimented with various types of dopes, cements and glues. Also the wood covering (skin) as compared to the other finishes, such as paper, nylon and plain. These end up being heavier than the wood covering, because of the large amount of filler necessary to fill in the Styrofoam pores. With the wood covering, the finished product is ten times stronger, as well as a much harder surface for compounding to get that high luster finish. My model was finished with two coats of clear dope, lightly sanded with fine paper; followed by three coats of Testor Sanding Sealer, each sanded with Number 300 grit; topped off by three coats of Testor's colored Butyrate dope.

For the sake of comparison, I made up a wing, same size as these plans, using the conventional rib and spar construction. Planked with 1/16 balsa, it was found that the Styrofoam wing was actually one ounce lighter than the conventional wing. Although there is no grain, or splitting, to worry about when using Styrofoam, raw-stage Styrofoam dents easily—so handle it

lightly. I, myself, have had no contest carrier experience but on many occasions have done 90 to 95 mph over seven laps from take-off, then slowed down to below 20 mph. You carrier experts should really get results from this swell flying machine.

Below is a list of cements and glues that can be used on Styrofoam. Your local hardware store, or lumber yard, should have one or more of the brands listed below.

SPECIAL SUPPLIERS

Flintkote #740: The Flintkote Co., Whippany, N. J.

Polybond Q-70: Polymer Industries, Inc., Astoria, N. Y.

Styrofoam Adhesive: Floralfoam Products, Midland, Mich.

Weldwood Prest-Set Glue: U. S. Plywood Corp., 55 West 44 St., New York 18, N. Y.

Rez-N-Glue: Schwartz Chemical Co., 136 West 79 St., New York, N. Y.

Elmer's Glue All: The Borden Co., 350 Madison Ave., New York 17, N. Y.

Styrobond Adhesive: Naranco Resin & Coatings Co., Costa Mesa, Calif.

USES .15 to .19 WING SPAN—56" ENGINES



"SUPER CUB"

The all-new "Super Cub" is a full fledged R/C model patterned after the very latest of the tried and proven Piper Cubs such as the "Super Cub", Cub "Special" and Cub "Sprayer". Incorporated with the scale appearance are all of the famous Live Wire design features that give real R/C performance plus great looks!

Like the "Champ", the new "Super Cub" is an extremely versatile model capable of excellent performance with rudder only control, yet it will handle the most fabulous 5 channel equipment with equal ease! Complete information is given so that you can build it and fly it with any type of controls that you may desire, you choose the combination!

Complete Deluxe Kit \$11.95

deBOLT MODEL ENGINEERING CO.

"Home of Design-engineered Models"

WILLIAMSVILLE NEW YORK U.S.A.

NOW! TWO

R/C SCALE LIVE-WIRE SUPERIOR KITS

- ★ Removable R/C units!
- ★ Big, full size plans with detail!
- ★ Special Radio sheet!
- ★ Complete model instructions!
- ★ Complete radio installation!
- ★ Testing & flying instructions!
- ★ Selected premium grade balsa!
- ★ Tough, hard maple parts!
- ★ Covering material!
- ★ Complete hardware!
- ★ Formed dorsal gear!
- ★ Precisely machined and sharply die cut parts!

WING SPAN—56" USES .15 to .19 ENGINES



"CHAMPION"

The "Champ" is the well known and accepted Live Wire R/C scale model of the ever popular "Aerona Champion". With the scale appearance you get the fabulous Live Wire design features which give such fine wind penetration, extreme stability, excessive ruggedness and wonderful maneuverability, plus the ability to carry more than its own weight in R/C equipment!

There is no complexity with the "Champ" or the new "Super Cub", the materials are the finest and fully prefabricated, the instructions are complete and the models will practically fly themselves for many seasons to come!

Complete Deluxe Kit \$11.95

SEE YOUR HOBBY DEALER

OR NOT CONVENIENT ORDER DIRECT

These Blankety Blank Dethermalizers

(Continued from page 21)

protrudes above or below the wing a short distance out from the fuselage and which "spoils" the flow of air over the airfoil, destroying the lift of that section and acting as a brake by increasing drag. They act perfectly on full-scale gliders, but make very poor dethermalizers for models.

A spoiler scaled in proportion to a full-sized glider is practically ineffective on a model. To be effective, the spoiler must be made very large indeed. This results in construction problems which are difficult to solve, and mechanical problems of tripping the apparatus that are too complicated to be reliable.

Spoilers of equal area must be built into each side of the wing, otherwise a spiral dive will result that will wreck a gas model. If the spoiler on one side of the wing sticks or doesn't open quite as far as the one on the other side of the wing, a bad spiral dive might result. Although spoilers can be made to work, there are more reliable and simpler devices which give far safer and better results.

An idea which resulted from the wing spoiler system was the spoiler on the fuselage. This consisted merely of a large flap or door which opened outward from the fuselage. This placement of a spoiler, of course, did nothing to decrease the lift of the wing and was therefore less effective than the wing spoiler. It did have the advantage of being easier to build and far simpler in its tripping mechanism. It works in very small thermals, but when a big one comes along and there is really a need for a dethermalizer, a fuselage spoiler is ineffectual.

Shifting the center of gravity towards the rear of the ship so that the airplane would stall out of a thermal was another idea. A lead weight was housed in a small compartment in the bottom of the nose of the ship. A string was fastened to the weight and to the tail of the ship. When the door of the compartment was opened, the weight would fall out and hang to the tail resulting in a considerable movement of the center of gravity.

My experiments with this method of dethermalizing were made on a towline glider. At first, I thought that the idea was going to work, for the resulting stall brought the ship down in a hurry when no thermals were involved. A violent stall might result in considerable damage to a gas job, but at that time I thought if it worked, it would be worth the risk. One discouraging characteristic of this type

NEW!---IMPROVED!

THE NEW IMPROVED 1957 SERIES OF ESSCO-LORENZ RECEIVERS NOW AVAILABLE

NEW 11 AND OUTSTANDING
LOOK at these TOP VALUES in reliable TWIN TUBE SETS. Features small size, wt. & battery drain. Sensitive stable input stage assures long & reliable range at low cost. "NONCREEP" 2nd stage. ESSCO-LORENZ BASIC KIT, non-diode model \$3.95
TWIN DIODE MODEL, 1st stage idle .25 ma 4.95
CASCADE DIODE MODEL, 1st stage idle .2 ma 6.95
For kit with tubes add to above prices 5.00
All kits supplied with complete instructions, plastic case suitable for housing set, relay & controls.

SUMMINIATURE in size, 2x2 1/2 x 1 1/2, wt. 2 oz. A GIANT in performance. . . Crash damage resistant. Housed in TYNONE plastic case. Sensitive long reliable range at low cost. Exclusive UNIQUE 2nd stage eliminates "creeping" & relay chatter. Low B battery drain allows all season operation with a set of batteries. 1st stage idle .1 ma. Uses new type RAYTHEON TRANSISTOR 2nd stage. Relay current change up to 5-6 ma if desired. Guaranteed to outclass & outperform all similar sets.

Model R612X includes GEM relay 21.95
Model R61CX includes SIGMA 26F relay 24.95

ESSCO MINI-CONTROL PANEL. Matching TYNONE Plastic case houses 2 submin pots & closed circuit metering jacks, receiver cable plug socket & DP slide switch. Prevents equipment failure due to dirt, fuel spill-over & splash proof for boat models. It's a "cinch" to install RC in any model with this exclusive ESSCO Control Panel.

Wired and ready for use 4.95

WHAT'S NEW IN RADIO CONTROL?
The HILL RECEIVER (June AEROMODELER). An unusual TWIN HARD TUBE receiver, equal in sensitivity-reliability to standard dual tube sets using Gas tube first stage. Reliable range, smooth operation. Simple stayput tuning adjustments. Features 4 ma idle & 4-5 ma current rise with 30 volt B battery. Extremely lone tube & battery life.

ULTRA SENSITIVE - SUPER RELIABLE - LONG RANGE COMPLETE ESSCO DELUXE PARTS KIT includes drilled base, coils, top grade parts, tubes, relay. 14.95
DELUXE SUMMIN. MODEL, uses submin tubes 17.95
Either model, factory wired-tested, add 5.00
BB54 2 volt/20 amp hr. \$2.50; BB54A 27 amp 3.45
Heavy Duty Exide 2 volt/35 amp hr 3.45
SOUTHWESTERN & WILLIAMS "MACUATORS" 5.95

WHAT'S NEW IN RADIO CONTROL?

THE GOOD TWO TONE PULSE WIDTH SYSTEM (JAN-FEB. AMERICAN MODELER) simultaneous rudder/elevator engine control on single RC channel at reasonable cost. Complete deluxe parts kit includes all specified items & preassembled base. \$34.95

Factory wired-Tested, ready to install. 44.95

DELUXE ESSCO Parts Kit to build the GOOD dual proportional control XMTR as specified. 59.95

COMPLETE GOOD XMTR built/order as spec. 89.95

DELUXE ESSCO Parts Kit to build the special dual pulser and modulator units for use with your present MOPA XMTR 29.95

SUPER DELUXE ESSCO Model with special built-in highly filtered-voltage regulated power supply with cell & battery charger. Unique ESSCO MULTI switching meter for complete checking of all critical circuits & antenna tuning indicator. 125.00

CUSTOM BUILT to order 125.00

Note: Essco's reputation for supplying the best material at superior value requires no special endorsements. Our standard sets and kits are guaranteed to be equal or superior to the original specifications.

NEW! ESSCO CONTROL BOX FOR BONNER VARI-COMP 8.95

ABOVE ALL . . . HIPOWER 5 WATT ESSCO MACII

BEST VALUE. Most preferred. Over 1000 in use by active modelers who appreciate top quality first.

Complies with FCC standards. Complete deluxe model equipped with HD 2 volt cell & vibrator pack, built-in battery charger for 2 & 6 volt units. 44.95

UNIQUE ESSCO exclusive feature includes BIG 3" sq. multi-range jewel bearing meter (mfrd USA) reads A & B volts/current, battery charge indicator & RF OUTPUT INDICATOR-FSM. 44.95

With Dualtone (to FCC stds) Audio MOD. 49.95

Dry battery powered model, factory wired. 29.95

In kit form less meter \$19.95. With meter 24.95

Add \$6.00 to above 3 models for dual audio tone model.

THE NEW MOPA AUDIO TONE MODULATOR

A high quality, stable and stayput multi-tone modulator for use with your present XMTR including all 5 watters. Use the FCC approved type of non-interfering Modulation. 19.95

Complete unit ready for installation

ESSCO - NEW YORK

58 WALKER STREET
NEW YORK 13, N. Y.

BUY ESSCO RC PRODUCTS

at your local dealer
PROMPT-FRIENDLY SERVICE

ESSCO - WEST COAST

P.O. Box 325
Menlo Park, California

NOTE: COMPLETE MAIL ORDER STOCKS MAINTAINED AT ALL THESE LOCATIONS

California, Los Angeles
COLONEL BOB'S, 3707 1/2 W. Pico Blvd.

California, Oakland
BOB'S HOBBY HUT, 6036 Telegraph Ave.

California, North Sacramento,
C & M HOBBY SHOP, 1613 Del Paso Boulevard

Delaware, Dover
MACK'S HOBBY CENTER, 30 Lockerman St.

Florida, Miami
ORANGE BLOSSOM HOBBIES, 1906 N.W. 38th St.

Indiana, Indianapolis
CENTRAL STATES HOBBY HQTS., 1904 W. 64th St.

Louisiana, New Orleans
NUB APPLIANCE CO., 2618 So. Broad Ave.

Missouri, Kansas City
MODEL AIRCRAFT INSTITUTE, 3507 Prospect Ave.

Massachusetts, Hyannis
THE HOBBY SHOP, 530 Main Street

Michigan, Allen Park & Detroit Area
HOBBY BUNGALOW, 6747 Allen Road

New Jersey, Camden & Collingswood
COLLINGSWOOD HOBBY SHOP, 648 Haddon Ave.

New Jersey, Red Bank
HOBBY HEADQUARTERS, 210 Shrewsbury Ave.

New York, Buffalo
MODEL LAND, 187 W. Ferry Street

FRONTIER HOBBIES, 3183 Bailey Avenue

New York City, Bronx & Westchester
BROWN'S HOBBY CENTER, 6031 Broadway

New Jersey, Clementon & South Jersey
CLEMENTON MODEL SHOP, 21 Gibbsboro Road

New Jersey, Parsippany
RICH'S HOBBYTOWNE, INC., U.S. Rt. 48

New Jersey, Perth Amboy
FISHKIN BROS. HOBBIES, 157 Smith Street

OHIO, AKRON
LAKE HOBBY SHOP, 530 Portage Lakes Drive

Ohio, Barberton
BARBERTON HOBBY SHOP, 190 Second St., N.W.

Ohio, Cincinnati
HOBBY HAVEN, 3928 Glenway Avenue

Oregon, Portland
BOB'S MODEL SHOP, 3023 N.E. Union Ave.

Pennsylvania, Allentown
GENE BLOCH'S PAINT STORE, 22 No. 8th Street

Pennsylvania, Bristol
BRISTOL MODEL SHOP, 1031 Pond Street

Virginia, Richmond
THE HOBBY CENTER, 3020 West Cary Street

LATEST OFFICIAL AIRCRAFT PHOTOS

NOW, FIRST TIME, GET exclusive,

official, sharp photos of advanced Supersonic Rockets, Jets, Historical planes. All makes, hundreds from which to choose.

SPECIAL INTRODUCTORY OFFER with your name and address. Send only 25c . . . select one packet.

1. 4 3 1/2 x 5 photos, world's fastest Jets. All four packets for \$1.00
2. 4 3 1/2 x 5 World War II planes.
3. 4 3 1/2 x 5 of Rockets, Missiles.
4. 1 8 x 10 photo Boeing B-52 Jet Bomber. \$1.00

Large illustrated catalog free with each order. Absolute money back guarantee.

MAIL YOUR ORDER NOW . . . TODAY.

AVIATION PHOTO EXCHANGE

Dept. UC Box 73084, Los Angeles 5, California

CONTROL LINE

THROTTLE

FOR ENGINES .19 to .35

VECO

FOX

(And Most Others)

\$4.95

At Your Hobby Dealers

- True carburetor principle, varies fuel MIXTURE.
- Operated by escapement, servo, or third line.

SEND FOR FREE BRAMCO RADIO CONTROL CATALOG

KAY Specialties

Box 5197
Grosse Pointe Farms, Mich.



DEALERS!

Send for a free sample Copy of the hobby industry's leading trade magazine.

Packed full of information designed to help you sell more hobby merchandise.

CRAFT, MODEL & HOBBY INDUSTRY

30 E. 29th St. New York 16

was the fact that the weight hanging on the string had the bad habit of swinging through the tail and wing surfaces, making numerous holes before the ship got to earth, but even this might be excused if the ship would only come down. However, the first time the towline job hit a thermal and the DT worked, it stalled merrily but continued to rise in the thermal and was lost. A few more experiments proved that the shifting of the center of gravity was not the DT idea to work on.

An article was written in one of the magazines which described a DT that looked like the final solution. This was the infamous spool-of-thread idea, and caused many fliers to curse the theorists who write articles before testing their ideas.

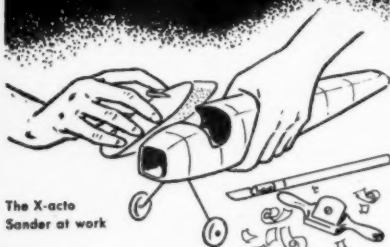
This DT consisted of a spool of thread which was housed in a compartment in the fuselage. The end of the thread was fastened to a wing tip. When the spool was released, it would hang far below the ship on one wing tip. The weight on the wing tip would cause the ship to spin. But, when the airplane got close to the ground, the spool would rest on the earth taking the weight off the wing tip and the ship would level off and make a perfect landing.

The theory sounded so good, that a whole gang of us equipped our ships with them. We had some trouble with the thread unwinding and getting messed up in things, but this was a small matter that would be worked out later.

The first time one of these DT's worked was on a perfectly windless day. The seven-foot job was directly over-head and almost out of sight when it started its spin. Everything worked perfectly except for one small detail. The ship spun so fast

There's a precision-made **x-acto tool** for every Model Plane job!

For any model... flying, solid scale, glider, rubber, gas, jet, radio free flight, control line... X-acto tools put more skill at your fingertips. Designed by craftsmen and produced to quality standards, they help you to do better, faster, more professional work.



The X-acto
Sander at work

Sanders • Spoke Shaves • Planers • Balsa Strippers • Knives • Hammers • Clamps • Pliers • Razor Saws • Files • Screw Drivers • Drills • Saws • Pin Vises. Singly and in sets, 10c to \$30.

Complete details in 28-page catalog—only 25c
Send for "Building Flying Models" manual—10c



48-53 Van Dam Street,
L. I. C. 1, New York

FLASH MONO-LINE

CONTROLLED MODELS

WON 14 FIRSTS AND SET 10 NEW RECORDS AT RECORD SMASHING 1956 NATIONALS

As In SPEED, Mono-Line Flying Now Opens An Entirely New Field For Winners In STUNT & COMBAT YOU TOO Can Be A WINNER By Joining The Thousands Of Modelers Now Switching To MONO-LINE

SKY RAIDER

**STUNT & COMBAT MODEL
FOR CLASS
A, B & C ENGINES**

RAIDER KITS ARE COMPLETELY PREFABRICATED AND FEATURE SENSATIONAL NEW MOLDED PLASTIC WING TIPS & CANOPY

KIT COMPLETE \$4.95

Presenting The Mono-Line RAIDERS

FLYING SENSATIONS

STUNT-MASTER
CONTROL UNIT
For Stunt & Combat Flying

STUNT-MASTER for 1/2 A \$1.95
STUNT-MASTER for Class A, B & C \$2.50

LIL' RAIDER
Half-A
STUNT & COMBAT MODEL

\$2.95
COMPLETE KIT

VICTOR STANZEL & CO.
SCHULENBURG, TEXAS

that the spool of thread was streaming out behind the ship. The airplane hit the ground before the spool of thread, and with such speed that it was smashed to bits.

A conference amongst the fellows who had equipped their models with the spool-of-thread DT led to the conclusion that we had made a mistake in fastening the thread to the wing tip on the inside of the turn. Everybody switched their threads to the wing tip on the outside of the turn. The same disastrous results demolished another good airplane.

We fastened the thread to the stabilizer tip on the inside of the turn. Another airplane was brave enough to try it on the stabilizer tip on the outside of the turn. When it finally worked, the ship went from a nice right turn in the glide to a perfect left turn. It sailed away on the

thermal and was never recovered.

Mechanisms to flip the rudder over and cause a spiral dive work fine on light ships such as towline gliders or some rubber jobs where the ships are so light that the rate of descent is slow and the ship is not damaged on contact. But, on heavier airplanes, and especially gas jobs, the descent is too fast, and a violent contact with the ground results in considerable damage. Besides, rudder adjustments are extremely critical during the fast climb of a high-performance gas job, and I feel that the rudder should be solidly fixed at all times to avoid trouble.

In considering any DT, the possibility of its working during the time of the engine run must be taken into account. If a DT that moved the rudder happened to work during the time that the engine was running, the results would be so disastrous

POLK'S Model-Craft HOBBIES

RADIO CONTROL · MOTORS · BOATS · KITS · FOR THE HOBBYIST

TRANSMITTER KIT

Aristo MOPA

Designed by Ed Lorenz, the MOPA is the most advanced transmitter available. Features: printed circuit chassis • 27Mc frequency • high tolerance components • extended range design • "tuning eye" for fast checking • comes with instruction book. **\$14.95**
Ready-to-use (circuit board) **19.95**



ARISTO MULTI-TESTER



Designed for R/C Enthusiasts! Full 24" Meter Face. A sturdy built-in, testing unit covering EVERY R/C need—2.5%. This is not a "reworked" surplus test meter. • All M.A. readings to 1000 M.A. • Moving coil type meter • 100 ohms to 10k • All DC readings to 200 Volts • Zero adjust • Ohms adjust • Black and Red test leads, grade 500. Hi-impact, black plastic case. **14.95**

Clockwork Reconversion

FOR BOATS & PLANES

Ideal for marine use, self-powered with no need for spring wound motor. For two or four position operation. Weight, 3 ounces. **\$11.95**



DEALERS - JOBBERS! REGULAR TRADE PRICES. INQUIRIES INVITED

MILLS DIESEL 13.95

WIND SPEED THROTTLE SPEC. — Displacement, .061 cu. in. Bars A06 in. Stroke, .025 in. Wt. 3.50 oz. Max. H.P., .063 at 10,000 rpm. Flow, 100 cc. min. Fueling, .07 B.H.P. per cc. Max. Torq. 12.4 oz. in. 5-6,000 rpm. **.048 MOTOR 10.95**

E. D. SUPER POWER DIESELS

• E. D. 21 cc. in. Mark 4 (Class B) **\$19.95**
• COMPETITION SPEC. 12 (Class C) **\$12.95**
• E. D. .065 cu. in. **\$11.95**
• E. D. .15 cu. in. Racing Special **\$16.95**

WEBER DIESEL ENGINES

WIND BATTERIES: TWO WIRELESS TWO PUSHS!
• WEBER Record .20 cu. in. **\$9.95**
• WEBER Winner .15 cu. in. **8.95**
• WEBER Mach. 1.15 cu. in. **13.95**

DOUBLE PER-MAG

MOTORS

Redi-mount, high efficiency, low drain, light weight, 1.5 to 6V battery operation.
No. 01 .89 No. 2 **1.50**
No. 0 .89 No. 3 **2.95**
No. 1 **1.25** No. 4 **4.95**
No. 1.5 **1.35** No. 4.5 **3.95**
No. 5 (Illustrated) **4.95**

Aristo SWITCH MOTOR

Plastic enclosed. Features built-in switch for forward, reverse. **\$2.95**
No. 2 **1.75**



ARISTO-CRAFT OUTBOARD MOTORS

A complete range of Electric Outboard Power Plants designed to power boats from 12" to 24" • Per Mag Motor • Steerable • Operates on 3 to 12 volts D.C. • Order yours by number to fit your needs.

12 INCH SPEED BOAT

A sleek 2 seater, features: working headlight • powerful double per mag motor • all spring loaded battery box • nickel-plated fittings • steering wheel • instrument panel • life preserver. Packed Ready to Run **\$4.95**



Constructo SPINNING WHEEL

\$2.95 12" high, 10" wide. Beautifully grained, hardwood parts. Ready finished (carved, grooved, rounded, etc.) Assembles neatly, quickly with minimum sanding. You'll be proud of this "conversation piece!"



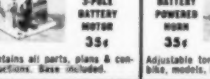
CONSTRUCTO SHIPS

Pre-fabbed parts with simple instructions for beautiful results.
MARITIME SERIES
Cutboat • Felicia
• Celtic Hispaniola
• Tug **1.95**
SELECT SERIES
Cutboat 7.95 • Valchery 10.95



ARISTOMATIC PILOT ...79¢

FOR MODEL BOATS with 2 Cams for different maneuvers. E-Z to install—instructions inc.



1" Sq. MILLIAMETER

Small enough to build into your Model. Specify range desired when ordering. Wgt. approx. 3/4 oz. 0 to 1, 0 to 5, 0 to 50 **\$5.95**



ARISTO-CRAFTED U-KITS

3-POLE BATTERY MOTOR 33¢

Contains all parts, plans & construction. Base included.

BATTERY POWERED RUN 33¢

Adjustable tone for door alarm, bike, models, R.C. Bells, etc.

CRANE & BEAR SET 50¢

Makes interesting mechanical devices that really work.

MARINE POWER-PACK

Ready to install in motor boats, vehicles, etc. Contains Motor Mount, Switch, Battery Box, Universal Mount Screws, Light, Life Preserver. **A. FOR SMALL BOATS \$1.75**
B. FOR LARGER BOATS \$2.95

ARISTO-REV MOTORS

• Overall 1 1/2" • Ball Bearing • Max. Dia. 1" • Wgt. 2 1/4 oz. • Carbons 4000 R.P.M. and power on 4 1/2 Volt • 1/1000 Amp. • 60 min. App. 40 hrs. on 2 Pen cells. **\$2.95**

AIR-WHEELS

Inflatable, with Adapter, super-light weight, 1 yr. guarantee.
2" **3.95** 3" **4.95**
2 1/2" **3.95** 4" **5.95**
6" **16.95**

PROPELLERS

Made of Hi Impact plastic, designed for high engine performance.
8x4 **.75** 8x6 **1.00**
7x6 **1.00** 8x8 **1.25**
8x4 **1.00** 10x4 **1.40**
10x4 1/2 **1.00** 11x5 1/2 **1.40**
8x6 **1.00** 10x6 **1.40**

ORDER CATALOGS

'MO' TRAINS **50¢**
SHIPS **90¢**
RADIO CONTROL VEHICLES **15¢**
'TT' TRAINS **25¢**
RIVAROSSI 'MO' HOBBY FUN **15¢**

POLK'S HOBBIES, Inc., 314 FIFTH AVE., DEPT. M.A. 27, NEW YORK CITY, 1

to a gas job that this type of dethermalizer should never be used.

Another involving the rudder which was reported to have been successfully used was one which increased the size of the vertical fin many times. This was accomplished by having several flat surfaces, which folded down into the stabilizer, pop up to form rudder area when released. The idea as explained by the originator was that this tremendous increase in vertical fin area would have a weather vane effect on the model. It would cause the ship to turn into the wind and glide in a straight line back toward the field.

I never experimented with this DT for two reasons. In the first place, as explained above, I do not like to meddle with the rudder on a fast gas job. In the second place, to expect the ship to turn into the wind and glide in a straight line against the wind is expecting a little too much. The ship might glide in a straight line alright, but it is just as likely to glide straight down-wind, or cross-wind, as up-wind. An airplane gliding in a wind acts exactly like a boat floating in a river, and who would expect a boat in a river to turn and head up-stream just because it had an overly large rudder?

The dethermalizing experiments described so far make the picture look rather bleak. But, there are two types of DT's which have proven very successful. These are the pop-up tail and the parachute. Each has its advantages. Fliers who have used both sometimes prefer one and sometimes prefer the other. Neither type will generally smash up the airplane if it happens to work during the climb.

The parachute type has the advantage of being entirely separate from the air-

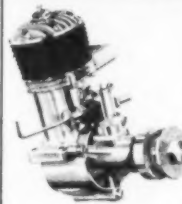
plane. It is not an integral part of the ship and therefore cannot interfere with the delicate adjustments of it. Where a weak part might result near the tail of the model if a removable stabilizer were used, the 'chute has the additional advantage of assuring a stronger fuselage. Furthermore, the releasing mechanism can be made very simple and in such a way that it does not put a strain on the timer. That in itself is an important consideration as any strain or tension on pneumatic timers will cause them to stick or act erratically.

My own chute is 1 1/2 inches in diameter with a 3/4 inch hole in the center. Probably a 'chute of smaller diameter without the hole in the middle would work equally as well if it contained the same total area. But, when I first made a 'chute for this purpose, it was too large. Rather than make a series of new 'chutes of smaller areas, I cut a hole in the middle and made the hole larger and larger until I had the correct area to do the job. Since then, I have made all my 'chutes from this pattern because I know that it is right. I have used it on small class A and large class C jobs without changing its area. The proper area for a particular airplane seems to depend more on the design and adjustments of the particular ship rather than its size, but each flier will have to experiment to determine the correct size for his ship. If the 'chute is too small, it will not bring the airplane down. If it is too large, it will throw the airplane into a violent spin.

The 'chute must be made of high quality silk in order to assure its opening. Silk used in covering models is too light. The silk of a magician's handkerchief is perfect. (And, perhaps, appropriate—Editor) For the sake of peace, I do not recom-

TRADE YOUR ENGINE IN WITH US!

THE WAY TO CUT...
Cost of replacement



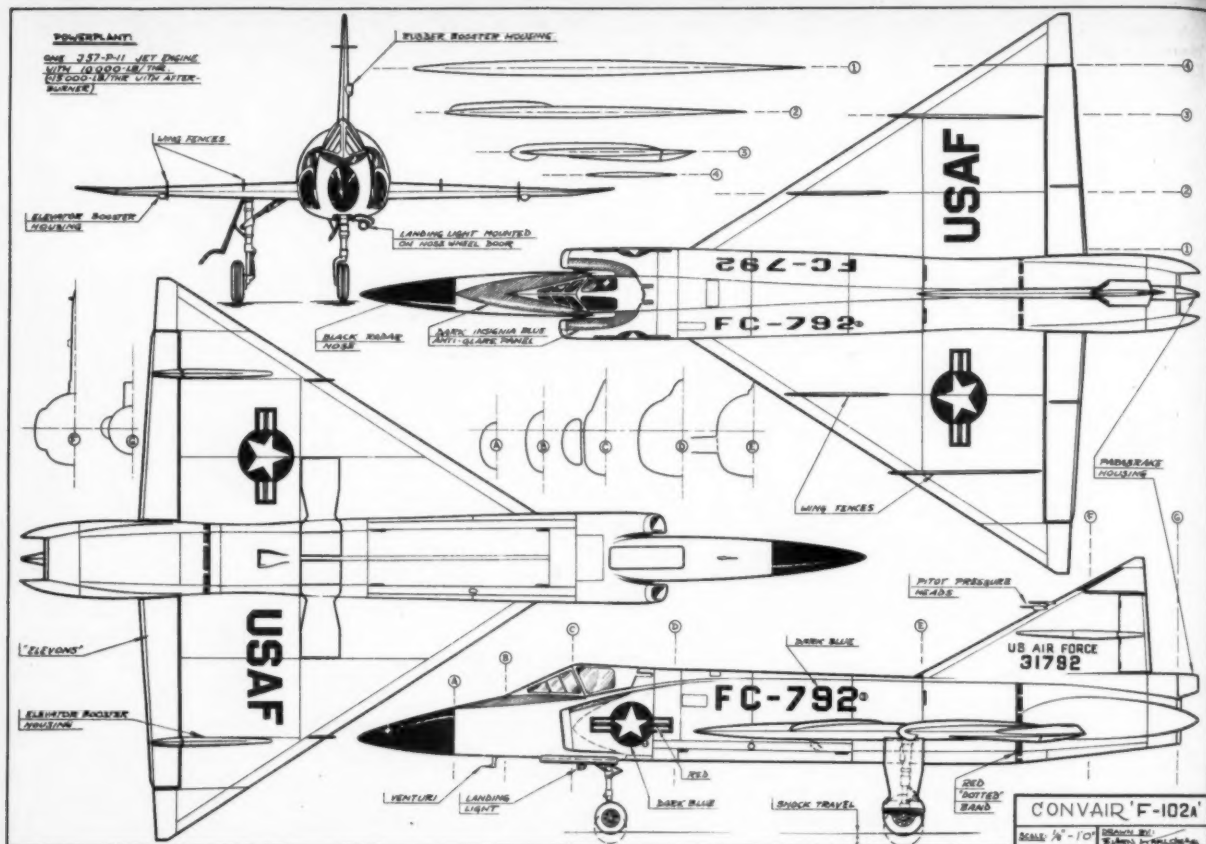
is to
Order Direct!
FORSTER
gives you more

MODEL "35" \$13.95

\$5.00 TRADE-IN ALLOWANCE ON YOUR OLD ENGINE,—

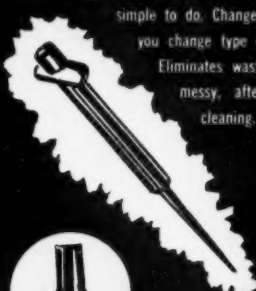
no matter what make, size or condition! Just mail it to us, together with \$8.95 plus 35c to cover postage and insurance and your new FORSTER "35" front rotary valve glow engine will be on its way! A lapped, cast iron piston, forged aluminum connecting rod, square rotary ports etc., give it the power of a "C" class engine with the weight of a "29". It is the finest engine made by the oldest established model engine manufacturer in the U.S.A., known the world over for outstanding quality.

WRITE US FOR FREE LITERATURE.
FORSTER BROTHERS, 7 E. Lenoir Ave., LANARK, ILL.



AUSTIN CRAFT NEWEST 3 in 1 GLUE GUN ...

Now for the first time ever offered, one Glue Gun that will do a complete gluing operation for pin pointing ... Spreading and normal gluing, easy, simple to do. Change tips and you change type of gluing. Eliminates wastes, stops messy, after gluing, cleaning.



Special introductory price
1.25

SPREAD TIP—Excellent for depositing a thin wide band on flat surface.



NORMAL TIP
The finest all around gluing tip ever engineered.

At Dealers everywhere or write direct to ...

AUSTIN CRAFT

431 S. VICTORY - BURBANK, CALIFORNIA



PIN POINT TIPS ...

A must where just a dab of glue is required.

Austin Craft 3 in 1 glue gun combination, carries the usual guarantee for material and workmanship.

mend the use of a piece of silk from the fair wife's scanties.

It can be made of a single flat piece. First, cut a 12 inch square, then cut off each corner to form an eight-sided figure with each side of equal length. A $\frac{1}{4}$ inch tuck on each side brings the diameter down to about 11 $\frac{1}{2}$ inches. The hole is cut in the middle and basted so that the material will not unravel. Eight shroud lines of strong thread, or string, about three feet long, are fastened to each corner. The shrouds are fastened to a strong piece of fish line another 3 feet long. A four-sided 'chute will tangle and refuse to open. More than eight sides with eight shroud lines is not necessary. Figure 1 shows a properly designed 'chute.

The string is fastened to the tail of the ship, and the 'chute is rolled into a compact pack and tucked into a compartment in the bottom of the fuselage. Figure 2 shows an excellent set-up for a 'chute DT.

When the timer releases the 'chute, it trails behind the ship, causing excessive drag. This tends to straighten out the turn of the airplane so that it will glide out of the thermal area. It will also slow down the airplane so that the wing loses lift, and if the 'chute is sufficiently large, the airplane might go into a spin for a couple of revolutions.

For some reason or other, this type of DT seems to be more severe when the ship is riding a thermal than when it is gliding naturally, which is quite a blessing in itself.

The pop-up stabilizer is another very excellent DT that is being used successfully. The graceful way that it brings the airplane straight down makes it a favorite for many modelers. Although it must be designed so as to put a favorable lever-

age on the timer, once its mechanical difficulties are worked out, it is a highly successful system.

With this DT, the trailing edge of the stabilizer is made to raise up while the leading edge remains in place. Thus, a very high angle of incidence between the wing and the stabilizer results. The wing and stabilizer both stall, and the whole ship sinks to earth like a parachute.

Neither a hinge at the front of the stabilizer nor a spring or extra rubber band to raise the trailing edge are necessary on a properly designed pop-up. The front peg for the hold-down rubber must be placed far enough forward and below the stabilizer platform to insure enough forward and downward pressure on the stab, to keep it in place in both up and down positions. And, the shoulder against which the leading edge of the stab presses must be wide enough to prevent the stabilizer from cocking in the up position. A metal hinge makes too rigid a connection and will not hold up for any time at all, especially on a large airplane.

Keys should be used to assure the correct alignment of the stabilizer in both its down and up positions. The biggest problem is to design a tripping mechanism with a favorable leverage to take the load off the timer.

A stop is used to insure the correct angle of pop-up. This is somewhere in the neighborhood of 40 degrees. Too small an angle will cause violent spins while too large an angle will cause a very high velocity of decent. A string fastened between the fuselage and the stabilizer is the simplest method of insuring the proper angle of pop-up. Figure 3 shows a well designed pop-up with all difficult problems completely solved.

A choice between the pop-up and the 'chute is entirely up to the individual flier. Each method works well and there are arguments for and against each. In either case the problem of a fool-proof, accurate tripping mechanism is the stumbling block for most builders. For this reason, the simple fuse-type timer has become very popular in most parts of the country. However, in this area the farmers are so afraid of fire that they will not allow the use of fuse-type DT's on their fields. As a result, the Northern California Free Flight Association has put a strict ban on fuses.

A safer "fuse" can be made from dry ice. A plug is cut from this material and fastened to the ship. The string attached to the releasing mechanism is looped around this plug. When the plug melts, the string releases the DT. Dry ice melts at a fairly constant rate just as a fuse burns at a fairly constant rate. The size of the plug of dry ice determines the time for dethermalizing.

In my opinion the fuse-type DT is not the ultimate solution. Once a good leverage system using a mechanical timer is built into the ship, it is far more convenient to use than the fuse type. Figures 2 and 3 show two systems that are practically fool proof. The hardware, except for the timer, for these systems must be built by the modeler. However, John Tatone of San Francisco, a noted modeler of many years experience, is producing for the local fliers all the parts for another leverage system patterned after a mousetrap. It can be used with any timer such as the Austin, Hillcrest, or Elmic. He is also about ready to produce a 6 minute clockwork timer to work with his mousetrap releasing mechanism. This timer can be accurately set for any time up to 6 minutes by a mere twist of a pointer. It weighs only 1/2 ounce and is absolutely infallible.

THEORY AND STUNT

(Continued from page 27)

shape can be made to do more work per unit area by increasing the chord of the wing or the airspeed. But it takes large changes to produce much increase in efficiency. For general use maximum lift coefficients will be as given in the illustrations.

All symmetrical airfoils, at low angles of attack, will develop a Cl of approximately .1 for every degree angle of attack, hereafter called AOA. What's Cl? It is a number used to define the lift capabilities of a particular airfoil at a given AOA and varies with Reynolds Number. For this lift equation see Equation 2.

Thus by knowing all but one of the components of this equation we can readily find the unknown.

Let's look at our model in level flight. Lift must just equal weight so let's see what AOA we need.

$32 = .000132 (432) (88)^2 (C_l) 60 \text{ MPH}$
 $= 88 \text{ ft/sec or } C_l = .065$. So our AOA will be .65 degree. At slower speed it will be more and at higher speed less. To estimate landing and take off speeds use a Cl of .8. This will give fairly close results, since accurate information is difficult to obtain when airspeed is not known. Our model would land at about 26 MPH. Take off could be slower due to propeller blast over part of the wing.

The main calculation we are interested in is the looping radius of our ship. We are required to turn smooth loops under 45 degrees. On any length line we can calculate our required radius from Equation 3.

With longer lines we have more room



**NOW!
COLD WEATHER
FLYING FUN**



1/2 Pints - 60¢

Pints - \$1.00



K&R ALLYN COMPANY • 5732 DUARTE STREET • LOS ANGELES 58, CALIFORNIA

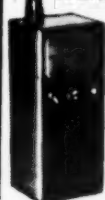
**Snow and cold weather need not halt
your flying fun.**

Modelers are discovering that they can continue flying their model planes in spite of the cold, when they use Supersonic "1000." It gives them quicker starts, smoother performance, and more power. For "cold weather flying" use Supersonic "1000" in all engines.

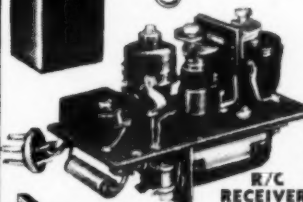
Have Flying Fun the Year Around!

R/C RECEIVER AND TRANSMITTER RANGE OF APPROXIMATELY 1 MILE

R/C TRANSMITTER



R/C ESCAPEMENT



R/C RECEIVER

AN R/C RECEIVER COMPLETELY ASSEMBLED AND WIRED — INCLUDES TUBE — READY TO OPERATE!

R/C Receiver is completely assembled and wired, with tube and ready to operate on exam-free 27.255 MC remote control band. Size: 1 1/2" x 1-15/16" x 3". Wt. 3.3 oz. Requires one 1.5 volt and one 45 volt battery.
F-208 Net **7.95**

R/C Transmitter is completely assembled, tested and guaranteed, and includes tube and 27.255 MC crystal. 6 section telescoping antenna. Size: 4" x 4" x 12". Less batteries. Ship. wt. 3 lbs.
F-249 Net **19.95**

TRANSMITTER 1 Burgess, 2D or RCA VS069 Net. Ea. .45
BATTERIES: 2 Burgess XX45 Net. Ea. **2.38**
 or RCA VS016 Net. Ea. **2.38**

R/C Escapement is completely wired, sturdy and self-neutralizing. Weighs 1/2 oz. Low current drain. Size: 1 1/2" x 1 1/2" W. Ship. wt. 5 oz.
F-194 Net **2.45**

SPECIAL COMBINATION OFFER

Consists of R/C Transmitter (F-249), R/C Receiver (F-208) and Escapement (F-194). All three at a super special price.
F-250 Net **28.95**

NEW! LITTLE "JEWEL" REMOTE CONTROL RELAY

• The Mighty Mite of the R/C Field • Weighs less than 1/2 oz!
 • Size: 3/4" H, 17/32" W, 1-1/16" L

2.75

A natural for remote control receivers, it is highly sensitive, and built to withstand severe crashes. The smallest commercial job available, it weighs less than 1/2 oz. Factory adjusted to pull in at 1.4 MA. drop out at 1.2 MA. D.C. Single pole, double throw. Used in outstanding R/C receivers.
 5,000 ohm coil **F-26** Net **2.75**

27.255 MC REMOTE CONTROL CRYSTAL



Low drift, high output, dependable frequency control. Tolerance 04%, .6750" wide x .9300" deep x .9750" high above pins; 1/16" between pins.
MS-296 Net **2.95**

Lafayette Radio
 100 Sixth Ave.
 NEW YORK, N. Y.

BOSTON 15 MASS. 110, Federal St.
 NEWARK 2, N. J. 24 Central Ave.
 PHILADELPHIA 4, PA. 134 W. Second St.
 WILSON 14, N. Y. 542 E. Hudson St.
 Include postage.

FREE! LAFAYETTE CATALOG

NAME _____
 ADDRESS _____
 CITY _____ ZONE _____
 STATE _____
 165-08 Liberty Ave.
 JAMAICA, N. Y.

McCROSKEY'S FABULOUS MUSTANG F-51 H!!

At last! The one and only Nat's Winning (Sen. Flying Scale) MUSTANG, by scale king Jim McCroskey. In one of the most detailed and authentic scale kits ever produced - with the model plans being carefully checked by North America's own engineers! The soft-smooth parts put together like magic, thanks to exclusive "Super-speed" construction which cuts building time by 25%. Make sure that you ask for the NEW JETCO Nat's Winning Mustang. If your dealer is out of stock, order from us direct, enclosing 25 cents extra to cover postage.



ALL SHEET PARTS DIE-CUT & PRINTED - INCLUDING THE WING COVERING

FULL COLOR DECALS HAVE ALL MARKINGS APPEARING ON THE FULL SIZE MUSTANG

ELEVATOR HINGES BETWEEN 2-LAYER TAIL SURFACES

LANDING GEAR, PUSHROD ETC. BENT TO SHAPE

SLIDING BUBBLE CANOPY & COCKPIT DETAILS ON PLANS

SHAPED AND HOLLOWED FUSELAGE TOP

SHAPED AND HOLLOWED UPPER AND LOWER COWLS

ALL BOMB, DROP-TANK AND ROCKET (6) PARTS ARE INCLUDED IN KIT

SPAN 30-3/4" FOR ALL .19-.35 ENGINES

KIT S-1 \$8.95

3 SUPER DETAILED PLANS BY CAL SMITH & BILL DEAN - FEATURING FULL SIZE FRONT, SIDE (LEFT & RIGHT), TOP, BOTTOM VIEWS - & SKETCHES OF ALL BUILDING STAGES. PLUS AUTHENTIC DATA AND PHOTOS OF MUSTANGS, UP TO FINAL "F-51 H"

SABRE STUNT

KIT CL-3 \$8.95
Most beautiful stunt model of all time - 60 in. all 18 in. 35 mm. Span 30" Wing Area 470 sq. in. Weight 2 lbs.

Jetco
MODELS

C. A. ZAIC CO. INC. • 883 LEXINGTON AVE. • BROOKLYN 21 • NEW YORK

for turning. To calculate the minimum turn radius for our ship we will equate the maximum lift with the centrifugal force. Actually this is not exact, but for our purposes will do. (See Equation 4)

Here we come across something interesting. Notice V^2 in both ends of our equation. This says the loop radius does not depend on velocity. In fact, this is true for small differences in speed, but remember our speed determined our Reynolds number, which in turn defines our C_L max. However, it has been found that dropping V gives effective results so we won't bother with it. Just don't lose sight of this point. See Equation 5.

To see how tight our ship will turn with a 12% airfoil, see the illustrations.

This is under our minimum for 60 ft. lines so our ship would be alright for the loops. With an 18% wing we can cut the radius to 16.2 feet and with flaps she comes down to 11 feet. All this by changing our C_L . It should be noted here that thicker airfoils are capable of flying at higher angles of attack, hence developing more maximum lift, but that they stall more

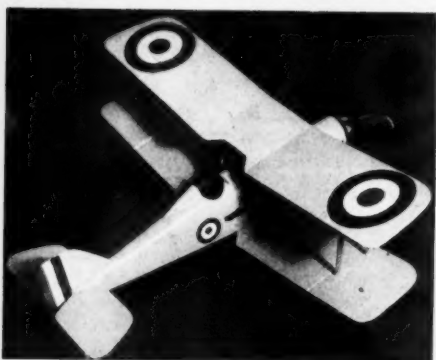
abruptly. The 18% section works like mad, but will suddenly fall out from under you. The thinner wings stall gradually and consequently make smoother landings. We will find that a 15% airfoil with flap is our ideal setup.

Our radius with flap was 11 feet meaning a 22 ft. diameter loop. How about these 10 foot loops and smaller? We have a pretty good airplane for a sample. The small-diameter loop is possible and has been performed many times, by the author and others, but it is not a loop in the sense that it is at a greatly decreased airspeed. We prefer to call this maneuver a somersault since it depends on a large increase in drag and then tumbling the airplane about its wing. A loop is performed with little noticeable decrease in airspeed, although we know there must be some, since drag increases as we increase our AOA. We normally compensate for this by setting the engine rich in level flight and allowing it to peak during a maneuver. Since we are interested in the 5-foot radius let's work our equation using a 2 lb. airplane, C_L of 1.6 and determine what area we

need (See illustrations). A in the formula equals 950 sq. in. which is more than twice the size of our wing. To build a ship this size to a 2 lb. weight is a real challenge. Also this size airplane would probably need a larger engine, would get heavier and larger and heavier and up we go. It might be possible with a .59 engine and a 3 1/2 lb. airplane. Area would be 1600 sq. in. Quite a beast.

The 5-foot radius is important to us on the square turns. And strangely enough people turn them every day. How? On the slow (60 MPH) airplane our theory is this. With the sharp application of control the plane noses up sharply and slows down at least 20 MPH. The wing becomes stalled, but remember that it will still develop maximum lift. The wing acts as a blanket to kill horizontal motion and generate additional lift due to flat plate area moved against the wind. The ship partly skids around the turn. The lighter they are, the better they look doing this. As control is returned to neutral, the thrust is able to take over and literally haul the ship around on its bootstraps. We will show

BRAND NEW! British S.E.-5A Gas Model



- 40" Span
- 32" Length
- 1 1/2" Scale
- 600 sq. in. Wing Area

Here is a flying scale model of this famous World War I fighter. An excellent performer, simple to construct. This set features pre-cut balsa body sides, pre-cut plywood formers, pre-cut ribs, authentic scale wheels, extra pair 3" Veeo semi-pneumatic wheels, 18 sq. ft. of PURE SILK for a perfect covering job, complete set of insignia decals including 6" diam. wing cockades, fuselage cockades and rudder stripes, 3" wood prop, pre-formed landing gear plus 1/4" bolts and fittings, clear, uncomplicated full-size plans, easy-to-follow instructions including data for "E" control, free flight and radio control. A cinch to build, a stand-out for looks and a rugged, stable flyer. This kit is a terrific buy at \$14.95

Add 25c for postage. Catalog—10 coin ppd. On Canadian orders add 30c postage.

MINIATURE AIRCRAFT CORP.

P. O. BOX 6A
STATEN ISLAND 14, N. Y.

SIG BALSA

Selected and processed specifically for model aircraft.

Precision cut, expertly graded.

OVER 300 STOCK SIZES

ASK YOUR DEALER— If he cannot supply you send 10c for big catalog of wood, models, and sample sheet of SIG BALSA.

SIG MANUFACTURING CO.
Montezuma, Iowa

Proudly We Announce

the 1956 super

***JOHNSON**
Engines

Packed with Power
& Ready to Prove It!

The Only Engines
Guaranteed for One Year

See Your Dealer

3 Great Engines

.29 Cu. In. Ship. • Beam or Radial Mount • \$14.99
.33 Cu. In. Ship. • Beam or Radial Mount • \$15.49
.33 Cu. In. Ship. • Beam or Radial Mount • \$15.99

Dynamic
Models, Inc.

1205 E. Ash Ave., Fullerton, Calif.

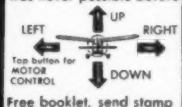
CASCADE!

with the new Bonner VariComp

- BONNER PERFECTION at a low price!
- VERSATILE! use in any system! rudder only—multi—servos

- VariComp
 - Cam Follower
 - Linkage Support
- All 3 for \$8.95!

Top notch flying on single channel such as was never possible before



BONNER Specialties 2900 Tilden Avenue
Los Angeles 64, Calif.

DEALERS!

Send for a
free sample Copy

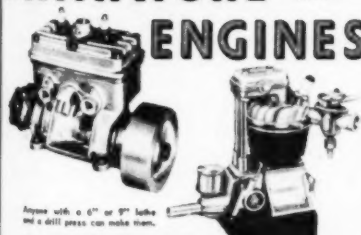
of the hobby industry's leading
trade magazine.

Packed full of information designed
to help you sell more hobby merchandise.

CRAFT, MODEL & HOBBY
INDUSTRY

30 E. 29th St. New York 16

MINIATURE Gasoline Steam ENGINES



Anyone with a 6" or 8" lathe and a drill press can make them.

BUILD THEM YOURSELF — IN YOUR OWN SHOP WITH YOUR OWN TOOLS

IDEAL SCHOOL-SHOP PROJECT

Send 15¢ for Illustrated Catalog of Miniature Engine Castings and Drawings

OPTURA MODELS
P.O. Box 536-MN Park Ridge, Ill.

later how to trim the ship for best square turns. With the fast airplane the small radius is largely an illusion caused by the rapid change of direction. This has been observed in careful study of the Half Fast in flight. Flaps help by increasing lift and drag during the turn. The 5-foot radius turn, while not being a constant-speed maneuver, is an actuality for most normal stunt ships.

It has been stated that the symmetrical airfoil develops a Cl of .1 per degree AOA. It follows that at zero degrees no lift is developed. This is quite correct and causes some headaches, mostly with airplanes flying around 85 to 100 MPH, particularly the all wing type. It shows up in a hunting action while you are forcing the ship to fly low, around 4 feet. Hunting consists of the ship alternately climbing and diving, both very slightly, usually twice per lap, but sometimes faster. The condition occurs because at high speed the wing must be held at a very small AOA, say one quarter degree or less. At higher altitudes the wing must lift more, due to its tilted or banked condition and the line weight. In level flight a minimum AOA occurs since minimum lift is needed. The difference between zero and our shallow angle is quite small and at times we actually get zero lift. The model drops, but the motion of the air is then such that it develops a positive AOA and climbs slightly. There is a visible lag involved which gives us our hunting. Actually, the wing cannot find the right AOA to support the ship. Solutions for hunting are several. Slow down, increase the weight, sharpen the leading edge radius slightly, add roughness to the leading edge to create some turbulence (not in Combat however), or balance the ship more nose heavy. The latter two solutions aren't necessarily desirable since one is illegal (in combat) and the last will make the ship sluggish. This is an argument for the slow stunt ship. With a hot combat wing some hunting can be tolerated in order to cram the last few ounces of lift in a turn. In stunt however, a great deal of time is spent at four feet so the problem must be considered. It should be stated here that for two airfoils of like thickness, one with a smaller leading edge radius will stall at a lower angle than one with the larger radius. Hence, more lift for looping.

Be back next month with dope on Flaps, CG, tug and other matters.

The Smog Hog

(Continued from page 20)

right side of the fuselage just behind the receiver box and operates the throttle via a 1/16" wire push rod. The rubber for the engine control is wound by a removable plug on the bottom of the fuselage.

WING—The wing construction is conventional with a few new wrinkles. The absence of heavy plywood dihedral braces may shock some of the old hands. However, there is a good reason. This is a case of when absence makes the wing grow stronger. The addition of plywood braces will cause stresses to center where the plywood ends, and could cause the wing to fold during a pull-out. Center section strength is achieved by scarf splicing the 1/4" square spars, leading and trailing edges. The top and bottom pieces of the front and rear spars should be spliced in opposite directions. The leading and trailing edges should also be spliced opposite. This, with the spar webbing and 1/16" sheeting on the top and bottom of the center section, will result in a center section just as strong (or stronger) and

FULL-SIZE PLANS

EACH SET OF PLANS FOR 25¢

- ☐ JENNY: Free flight scale, .409.
MARS: Bob Palmer stunter, .29-.35.
- ☐ WINNIE MAE: Lockheed Vega ukie, .049.
PELICAN: Willard flying boat, .049.
- ☐ VICTOR SCOUT: Scale control, .075.
SUPERMARINE: Ducted fan job for .09.
- ☐ THE SPACER: Class AB free flight.
STUMPY: .09 combat U-control.
- ☐ BEAVER: .19-.35 scale.
ZENITH: Taibi A free flight.
- ☐ SNIPE: Half-A stunt.
STRATHAWK: Limited rubber.
- ☐ EL DIABLO: .19-.35 stunter.
TRI-PACER: Scale ukie Piper.
PLAY PLANE: All-balsa FF, .049.
- ☐ HALF WILD GOOSE: .049 free flight.
FIRECRACKER: .29 scale.
- ☐ LONG TOM: .29-.35 free flight
SIDEWINDER: .049 profile ukie.
- ☐ SKEETER: Half-A scale team racer.
INTERNATIONALIST: FAI (.15) free flight.
- ☐ BOUNDER: Record .29 speed.
ZEPHYR: .049 free flight.
- ☐ HOTTER 'N THAT: .29 combat.
SUPER SAUCER: Large towliner.
- ☐ SKY WING: .049 flying wing.
CHALLENGER: .29 team racer.

WARNING INSTRUCTIONS. IMPORTANT!

Add 50¢ for postage and packaging on orders mailed 3rd Class. For first Class add 10¢ for postage and packaging and for Air Mail add 50¢ for postage and packaging. For EACH set of plans. Plans available only in groups as

MODEL AIRPLANE NEWS

551 Fifth Ave., New York 17, N. Y.

Enclosed is for which send me the sets of plans which I have checked, first class & air mail postage being extra.

Name Please print

Address

City Zone State



TWA Luxury Airliner SUPER-G Constellation

Big Kit With
Many Extras **Only 98¢**

Monogram

Four Star Plastik

SUPER PLANS

50¢ p.p.

Three big full size plans. Featured plan (top row each set) on giant 35 x 45 inch sheet; others printed on reverse side. Each set 50¢ postpaid.

• • • •

- ☐ GUARDIAN: U/C Scale, .29 up.
☐ SMOG HOG: Bonner's Multi RC.
☐ STRATOLINER: 2 Half-A, U/C.

• • • •

- ☐ AERO BAT: U/C Stunt, .29-.35 Dec. '56
☐ SNOOPY: Half-A, FF Sport. Dec. '56
☐ SEA GULL: Tail-less Towline. Dec. '56

• • • •

- ☐ ME-109 U/C Stunt, .29-.35 Nov. '56
☐ PACIFICOASTER: FF/RC, .19-.35 Nov. '56

• • • •

- ☐ THE MUSTANG—Nats scale UC. May '55
☐ BI-GONE—FF champ, sport bipe. May '55
☐ GLIDERS FIVE—All-balsa fliers. May '55

• • • •

- ☐ HALF FAST—Nats combat ukie. Apr. '55
☐ PERDIDO—Contest FF for .19. Apr. '55
☐ SHOREBOAT—RC boat for .09. Apr. '55

• • • •

- ☐ REARWIN SPEEDSTER—.035-.049. Mar. '55
☐ STUNT WING—Mirror Meet winner. Mar. '55
☐ RAMBLER—29 team race winner. Mar. '55

MAILING INSTRUCTIONS. IMPORTANT!

Plans mailed, postpaid, by Third Class Mail unless otherwise specified. For First Class, add 10¢; for Air Mail, add 20¢ for each set of three super plans.

MODEL AIRPLANE NEWS

551 Fifth Ave., New York 17, N. Y.

Enclosed is _____ for plan sets as checked.

Name _____ Please print

Address _____

City _____ Zone _____ State _____

56

lighter than one built with plywood dihedral braces. The reinforcing wires on the leading and trailing edges prevent the hold down rubber bands from cutting into them in the advent of a bad landing.

The leading and trailing edges are unique in that they were designed to be cut on a table saw and thereby saving the cost of pre-shaped parts. The plans give the angles and sizes to cut the stock to. Only the leading edge will require final shaping after leading edge sheeting is in place. The wing ribs, being all the same, are mass produced by first cutting blanks of sheet balsa, then stack and shape to final outline. The solid balsa tip is left solid for durability and also it helps to keep the weight high up where it should be. If desired, a conventional shaped trailing edge can be used by notching the trailing edge at each rib station and changing the rib trailing edges to fit. However, you may get the pucker that is so prevalent in most wings where the ribs meet the trailing edge in a but or slotted joint. Building the wing shorter, as indicated by the dashed tip outlines, will increase the flying speed of the model a bit but won't change the flight characteristics noticeably. Cover the wing with nylon for durability and strength. Check for warps before covering, because it is next to impossible to remove them once the wing is covered. Remember, covering will hide a lot of things, but not a crooked wing.

STABILIZER AND ELEVATOR.—Simplicity and ruggedness are the keynotes in the stab construction. Basically, it is a flat 1/4" thick stab with spars added to the top and bottom for strength. The ribs are formed simply by adding rectangular pieces from the spars to the leading and trailing edges on both the top and bottom. These are sanded to a triangular shape when dry. The finished product is a strong symmetrical stabilizer section. The top of the stab should be built complete and allowed to dry before removing from the plan to finish the other side. Sand to the shape indicated on the plans, cover with nylon and dope. The conventional slab-type elevators are connected together by a music-wire connector which has a brass control horn soldered to it. Lace the elevator to the stab with heavy thread at the points shown on the plans. Follow a figure "8" pattern.

FIN AND RUDDER.—There is nothing unusual about the fin and rudder construction. Sand to shape after gluing dorsal fin in place. Glue fillet blocks in place after shaping and make sure there is no off-set in the fin. Add control horn to rudder and lace to fin in figure "8" stitch.

FINAL ASSEMBLY.—Install radio receiver, servos and batteries according to the manufacturer's instructions. Solder all connections well, using rosin core solder and plenty of heat. (A cold iron will require that the iron be left on the joint longer, thereby heating up the components.) To get a good solder joint, clean all areas to be soldered. A cold solder joint is a weak joint, and may come loose under vibration. If a pair of needle-nose pliers are used between the soldered joint and the part to be soldered, the excess heat will be pulled off before it can damage anything.

After equipment is installed and operating, align the wing and tail on the fuselage and strap it down with rubber bands. Put model on the floor and block up the tail until the stabilizer is parallel to the floor. Measure the distance from the center of the wing leading edge and trailing edge to the floor. The center of the leading edge should be 7/16" higher than

WARPLANE FANS!

THREE NEW EDITIONS FOR YOUR AIR AGE TECHNICAL LIBRARY



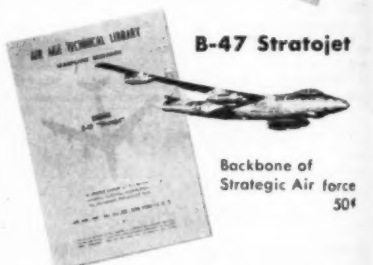
F-86 Sabre

Top fighter of
Korean War...50¢



F-94 Starfire

Modern all-weather
Jet fighter...50¢



B-47 Stratojet

Backbone of
Strategic Air force
50¢

Ideal for Collectors, Scale Modelers, Aviation Fans. Each of these fact-jammed 16-page booklets contains all the dope, specs and historical background of these famous warplanes plus an authentic three-view drawing and numerous photographs. Hard-to-get data on various modifications, development of each type. These booklets will be a priceless reference. All checked out by the Manufacturers.

Still available
in limited
quantities

B-17 Flying Fortress

Classic bomber
World War II...50¢

AIR AGE INC.

551 Fifth Ave., New York 17, N. Y.

Herewith \$ _____ for the following
booklets in your TECH MANUAL Series at
50¢ each.

- ☐ Enclosed \$2.00 for all four copies.
_____ copies F-86 Sabre _____ copies B-47 Stratojet
_____ copies F-94 Starfire _____ copies B-17 Fortress

Name _____

Address _____

City _____ State _____

the trailing edge. Shim leading edge or trailing edge as necessary. After checking this important measurement, check for proper location of the center of gravity.

FLIGHT TESTING.—Before leaving for the flying field, be sure your name, address, and phone number is inside and also outside in some obvious place. Don't forget, the fuselage is the most valuable component. Wings can be left up in a tree with the fuselage going all the way to the ground.

Bonner's method of flight testing is a very practical and safe way to make the first flight on any R/C model with engine control. There is no test gliding, which is impractical for any model of this size anyway, unless you are long legged and have a good set of lungs. This model has a respectable glide speed and would require a healthy shove to get flying speed.

Check the radio operation with the engine running and the model suspended off the ground by two rubber loops, one near each wing tip held by a couple helpers. This will approximate the vibration that will occur in flight. Check all controls. If all's well, you are ready for the first flight. Put only enough fuel in the tank for about 30 seconds engine run. Do not fill the tank completely, because a full tank coupled with a flyaway can result in a lost model. The first flight should be an ROG with the engine running at about 1/2 speed. This way, low speed will keep the model on the ground or stop it completely. Radio On. Head model into the wind and release. If you lose control during the take-off run (the model doesn't appear to be going to take-off), drop engine into low speed and taxi model back. Increase incidence of the wing and try it again. It should take-off with this 1/2 power.

After the model is airborne, get altitude, don't try any maneuvers on this first flight but just concentrate on any adjustments that will be needed to give a straight smooth flight.

When the model is flying just the way you want it, fill the tank, start the engine and peak it out, switch the radio ON, taxi down wind and swing around into the wind. Pulse for high speed and you are in the air with one of the sweetest flying R/C models in the air today. You can go through a complete stunt pattern, shoot touch-and-go landings, then make a low speed engine approach, land and taxi back to your tool kit. You will enjoy the ground handling characteristics of this model as well as the maneuvers it will perform in the air. Remember, it will take practice to perform all maneuvers perfectly, but that is what it takes to win contests. See you in the winner's circle.

Foreign Notes

(Continued from page 37)

only 1.65 oz. rubber, turned in initial flights of 2:28, 2:50 and 2:53 on 60, 68 and 70 percent turns, respectively, indicating an easy 3:00 max on full turns. Model is powered by 12 strands Pirelli rubber, made up to 22 in. length but stretched 24 in. between hooks, the tight setup giving a smoother and more complete run-out with, of course no risk of bunching. Turning an 18 in. double-fold, this gives a motor run of 45-50 sec. on max safe turns. Model itself is fairly conventional, with 41 in. polyhedral wing and a 34% stab. Climb is slow but steady up to 150-200 ft.

New Italian Challenger

Surprise item at the World Speed Championships was the Italian, Cellini's

Still the OUTSTANDING HANDBOOK on MODEL FLYING!

ONLY
\$3.75



NOW in its 4th printing, this widely acclaimed work by the pioneer aero modeler of our age, CHARLES H. GRANT, has taught thousands upon thousands of beginners and advanced students in schools, clubs, and air force personnel on the basic fundamentals of all flight—models and large planes. . . That is why this big volume is acknowledged the "bible" among aero modelers and aviation students over the world.

THE BOOK THAT ANSWERS A THOUSAND FLIGHT QUESTIONS

- What is the best wing section to use?
- How is lift generated and calculated?
- How big should a model plane be; how much power should it have?
- At what angle should the stabilizer be set?
- What pitch is required for a given flying speed?
- How can a plane be made laterally stable?
- How to prevent spiral dives?
- What size propeller should be used? ETC. . . . ETC.

Get your copy of this complete course at only \$3.75 postpaid. If you don't agree this is the finest course on model aviation and is just what you need, return within 10 days and money will be refunded in full!

AIR AGE, INC. • 551 FIFTH AVE. • New York 17

Fly to NEW HEIGHTS LONGER... SPEEDIER

With the Brand New

PAA-LOADER®

NEW "JETEX" JET ENGINE

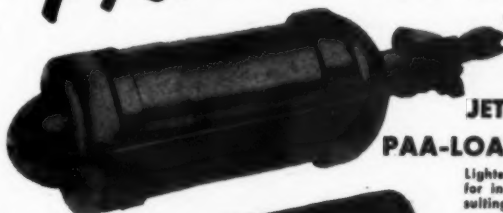
specially designed for

PAA-LOAD

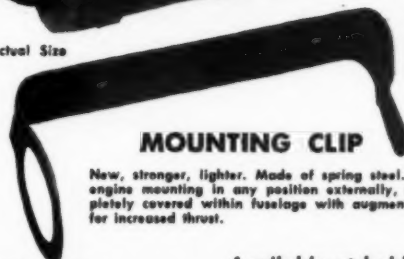
and other Official

JET FLYING CONTESTS

PAA-LOADER "JETEX" #150



Actual Size



MOUNTING CLIP

New, stronger, lighter. Made of spring steel. Allows engine mounting in any position externally, or completely covered within fuselage with augments tube for increased thrust.

*T.M. Reg. by
Pan American World Airways, Inc.

Available at hobby stores
or directly from us.

Lighter in weight, more compact. Allows for increased weight in model plane, resulting in greater durability of the craft.

ENGINE and CLIP,
with
complete instructions

\$1.98

(Uses JETEX #150
"Red Spot" fuel)

AMERICAN TELASCO, LTD., Huntington, New York

Ever Wish Your Planes Could Fly?

... Get ^{NEW} Carl Goldberg Models.

Dear Modeler:

At last, I have my own company—Carl Goldberg Models . . . and we're going to bring you a new line of flying models; easy to build, strong, capable of longer, more satisfying flights. And the plans have tips on how to get extra long flights!

First, is the "Shoestring", an exciting 18" model of the famous Goodyear Race winner. This sleek little beauty knifes through the air just like the original racer. It's easier to build than you think, too! Complete with all die-cut balsa, plastic parts, colorful decals, etc., etc.—ready to build and FLY!

Next there's the history-making Spirit of St. Louis. This model has the same steady flying qualities that made "Lindy's" plane famous. It takes off, makes a long smooth flight and gently settles back for a landing. Wingspan is 21" and it's all ready to build with die-cut balsa, plastic dummy engine, big prop, spinner, long rubber motor, wheels, big decals, —the works!

And then . . . there's the Ranger 21, generally similar to light planes you see at airports all over the country! An excellent flier—in fact, the best in its class—and it's easy to build! Complete with all die-cut balsa, plastic parts, big 11" rubber motor, and three color decals, in fact, everything to make a big 21" beauty.

All these FLYING beauties are at good hobby shops now! If your dealer doesn't have them send one dollar for each plane, plus 25c each, to cover postage and handling. Better yet, send three dollars for all 3 planes and we'll pay the postage!

Carl Goldberg
P.S. We're planning more models . . . how about sending us your suggestions.



CARL GOLDBERG MODELS
9849 S. CLAREMONT, CHICAGO 43, ILL.

the best in flying models...



"SHOESTRING" RACER KIT D2
18" wingspan\$1.00



SPIRIT OF ST. LOUIS KIT D1
21" wingspan\$1.00



RANGER 21KIT D3
21" wingspan\$1.00



Like to run trains?

Then you'll like . . .

MODEL TRAINS

. . . the monthly magazine that shows you the easy way to have more fun with all kinds of model trains.

Model Trains brings you track designs for O, O-27, S and HO; photos of other fellows' layouts; facts and photos on real railroads; plus articles on easy-to-make layouts, simplified wiring, ready-to-run scale equipment . . . everything to make model railroading easy and more fun.

SPECIAL OFFER

Get a 1/3 year's subscription to Model Trains PLUS this picture-packed book "Fun with Model Trains" that tells all about getting started in this fascinating hobby—a \$1.55 value for only \$1. This offer is limited, so mail the coupon with \$1 today!



MODEL TRAINS, Milwaukee 3, Wis. Dept 526AN

Please send me the 32-page book "Fun with Model Trains" and the next four issues of MODEL TRAINS at the special price of \$1. My \$1 is enclosed.

Name _____

Street Address _____

City, Zone, State _____

third place with a .15 cu. in. Barbini B40 glowplug motor. Clocking 124.3 mph to beat the Super-Tigres of the rest of the Italian team, Cellini's performance has created a great deal of interest in this new Italian motor.

It so happens that we have lately been testing a B.40 Glow which was submitted to us by the distributors, Solaria of Milan, some months ago. The engine is a development of the B.40 Diesel introduced nearly two years ago. It is a shaft valve motor having a reverse-flow scavenged cylinder in which two opposed exhaust ports are matched by two opposed and inclined bypass ports. The shaft runs in a roller type inner bearing, supplemented by a ball journal outer bearing.

In stock trim the output was .27/38 bhp running on a nitro fuel and following a four-hour break-in. Cellini's motor was reworked slightly and had modified intake and bypass porting, lightened piston and conrod and a slightly raised compression.

In Brief . . .

Japan . . . The O.S. people have new tone and multi-channel RC gear under development. May be expected to supplement existing Minitron single-channel equipment in due course.

Germany . . . A swing from Diesel to glow-plug is evident in Germany. Both Webrn and Star, formerly exclusively Diesel, are now concentrating on glow models. There have been complaints from German dealers about tricky starting with some small diesels.

Poland . . . New .15 motor reported from Poland is ARA-2.5B. Following short-stroke trend of East German Wilo and Hungarian Proton, ARA has bore and stroke of .610 x .512 in. and weighs 4.8 oz.

Cuba . . . The active and enthusiastic Havana group were recently honored with a request for a display by the Big Brass of the Cuban AAF. Two C-47's were placed at the modelers' disposal for transport.

England . . . Congratulations to Capt. Carroll, USAF, who showed the local lads by winning the single-channel RC event at the All-Britain Rally. Claimed to be the biggest one-day event in the world. Rally this year attracted 100 clubs and 14,000 spectators.

Bill Brown's Brainchild

(Continued from page 17)

proved D's, had chrome-molybdenum shafts.

After looking at modern motors of all sizes, one's impressions on re-examining the Brown, are of its tall cylinder, short frontal overhang, light weight and, looking inside, the modest dimensions of the stressed components. The Model D weighs 74 oz., which is only about half that of the average post-war .60. The crankshaft journal is a mere 5/16 in. in diameter and 1 inch long—a bearing area of 0.9818 sq. in. and, by a coincidence, precisely the same dimensions as that now used by the British Allen-Mercury 10 diesel—a motor of only one-tenth of the Brown's piston displacement. The long, slim conrod (it is some 2 in. between centers) has a shank 1/10 in. thick and 1/4 in. wide at the widest point, the crankpin bearing being 3/16 in. dia. by 1/4 in. The bronze wrist-pin, which is pressed into deep bosses in the piston, is only 1/4 in. diameter.

The engine is of the 3-port two-cycle type, the induction and exhaust ports being at the back of the cylinder while the bypass is at the front. The exhaust ports are in the form of four holes, 5/32 in.

(Continued on page 60)

MODEL AIRPLANE NEWS . . . list of approved Distributors



**SEND FOR OUR
BIG CATALOG**

**MODEL AIRPLANES
RAILROADS
CRAFTS • TOYS**



DEALERS HOBBY SUPPLY

P. O. Box 10353-C 2940 Southwest Blvd. P. O. Box 506-C
2009 Farrington Dept. KC-C 510 E. Sixth St.
Dallas, Texas Kansas City 8, Mo. Des Moines, Iowa

**25,000
ITEMS**



A Better Selling Tool...

Here's a short cut to more efficient operating — National's famous Cyclopedic. Nothing like it in the industry. Ask your dealer for a copy of the Model Builders Cyclopedic — \$1.00.

**320
PAGES**

A BETTER BUYING TOOL...

National MODEL DISTRIBUTORS
CHICAGO 14, ILLINOIS

DEALERS!

Don't Miss Out! Write For Our Exclusive
"GUARANTEED PROFIT PROGRAM"

WE SUPPLY EVERY BRAND
• AIRPLANES • RAILROADS
• ENGINES, PLASTICS ETC.



Specializing in Export, APO & FPO Shipments
MOD-AD AGENCY, INC.
152-156 West 25th St., New York 1, N.Y.

Bronco-Modelcraft Inc.
55 WEST 17th STREET, NEW YORK 11, N.Y.

Wholesale Distributors - Est. 1932.

We sell to the Armed Forces - and invite inquiries from foreign markets.

"Planned Hobby Depts Our Specialty"

Serving the South for Over Half a Century



**Walthour
and Hood
company**

206 ROGERS STREET, ATLANTA, GEORGIA.
Warehouse at Charlotte N.C., and Miami, Fla.

**CALIFORNIA HOBBY
DISTRIBUTORS**

"Everything in Airplane Models
for Southern California"
WEST OF THE ROCKIES ONLY

5751 HOLLYWOOD BLVD., HOLLYWOOD 28, CALIF.
Hollywood 7-5334

GHC ALWAYS EXTRA

Member Distributors in Hartford,
Buffalo, Philadelphia, Baltimore.

GENERAL HOBBIES CORPORATION
MEADOWBROOK, PENNA.

TOYS HOBBIES CRAFTS GAMES
30,000

ONE CATALOG ONE BILL
ONE ORDER ONE BOOK ENTRY

MARGO KRAFT
DISTRIBUTORS, INC.

419 S. 6th STREET, MINNEAPOLIS 15, MINNESOTA

**MAXWELL MODEL
DISTRIBUTORS INC.**

**SERVING THE
WEST COAST
PROMPT SERVICE**

3000 SOUTH HILL ST., LOS ANGELES 7, CALIF.

Everything DEALERS NEED

POLK'S MODEL-CRAFT
HOBBIES, INC.

RADIO CONTROL • MODEL PLANES
TRAINS • SHIPS • MOTORS • CRAFTS
EXPORTS-IMPORTS, THE WORLD OVER

SEND FOR FREE PYLON...
314 FIFTH AVE., Dept. M, N.Y.C. 1

FOR IMMEDIATE SERVICE



We supply only top-quality dealers - Crafts, Railroad, Models, Toys

**TRIPLE C CORP., 5700 EUCLID AVE.,
CLEVELAND 3, OHIO • UTAH 1-8010**

You'll be **'WAY AHEAD'**



with
Western Model Distributors

WHOLESALE ONLY
2601 SOUTH BROADWAY LOS ANGELES 7, CALIF. 1106 FIFTH AVENUE OAKLAND 4, CALIFORNIA

**LEITZSEY MODEL
DISTRIBUTORS**

"First in Service"

The South's largest Exclusive
Hobby and Toy Distributor.

P.O. Box 3066, Columbia, South Carolina.

MIDWEST
MODEL SUPPLY COMPANY

TWO Convenient Locations

361 Olive Street St. Louis 8, Mo. 7541 S. Halsted St. Chicago 20, Illinois.

P.D. HAYS CO.

• 500 MERCER STREET
SEATTLE 9, WASHINGTON.

• 1925 N.W. 22nd AVE.
PORTLAND, OREGON.

2 Branches in the North West



MODEL AIRPLANE NEWS . . . list of approved Distributors

LATEST "CUSTOM MIDGET" RADIO

CUSTOM RECEIVER



SIGMA RELAY INCLUDED



CUSTOM TRANSMITTER BOX INCLUDED



ALL THREE \$9.98

RECEIVER TUBE "IDLES" WHILE RELAY REMAINS IN UNENERGIZED STATE. (saving tube and battery)

TUBE CURRENT INCREASES AND RELAY BECOMES ENERGIZED ONLY WHEN TRANSMITTER IS KEYS

SHOULD RECEIVER OR TRANSMITTER FAIL WHILE IN USE MODEL COMES IN RATHER THAN FLYING OUT OF SIGHT (This new type of "Fail Safe" operation fully explained in our instructions)

Fully Re-Designed "CUSTOM RECEIVER" weight under 3 ounces including 10,000 ohm relay (relay included) plus Silver Ceramic Trimmer, midjet resistors & condensers, Nylon Coat Coil wire etc. Uses one X F G I Tube which IDLES while relay not energized saving Tubes life, Batteries etc. "CUSTOM TRANSMITTER" 27 M C Exam. Free Band with pre drilled base etc. Transmitter box only 4 1/2" x 5 1/2" (Box included) may be hand held or placed on Field. Has range of 1 mile or more. Full Drawings and instructions included. "CUSTOM ACTUATOR" of new magnetic principal operates both rudder and elevator or rudder alone off battery supply, no rubber used for Boats, Aircraft, or Cars of small 1/4 A size up to large 8 ft. models. You do not have to be a Radio Expert to assemble the 3 units, all parts are tagged and marked to correspond to drawings.

"CUSTOM MIDGET" RECEIVER TRANSMITTER and ACTUATOR \$9.98

Also Available "STANDARD MIDGET I" Radio kit, this group of 3 units, same design as above, same Relay, Same type Transmitter and Actuator. The difference from above is the Receiver weight which is greater (slightly over 4 ounces) Heavier components used.

"STANDARD MIDGET I" RECEIVER TRANSMITTER and ACTUATOR \$6.98

PLANS FOR THE "CUSTOM MIDGET" all three units... 50c

BOOKS "RADIO CONTROL OF MODEL AIRCRAFT" \$2.98 "RADIO CONTROL OF MODELS" 2.50 "RADIO CONTROL SHIPS, BOATS, AIRCRAFT" 3.98

"SUPPLY SOURCE DIRECTORY" Tells where to obtain Relays, Tubes, Crystals, all types equipment low as 1/20th normal price. \$7.00 MERCHANDISE COUPON FREE with Directory. price \$1.00 "SPECIAL 10 FOOT TRANSMITTER AERIAL" \$1.00 SPECIAL 10,000 OHM SIGMA RELAY \$2.98

X F G I tube.....\$3.50	0 to 3 Milliammeter.....\$3.50	Soldering Iron.....\$2.98	Black Crackle Finish Transmitter Cases 4" x 5" x 3".....\$2.98
3-A-4 tube.....1.00	0 to 50 Milliammeter.....2.75	Battery Tester, reads 0 to 2 Volts and 0 to 50 volts.....2.98	4" x 5" x 4".....3.25
3-A-5 tube.....1.35	Both Meters above.....5.25	Electric Motor 6 volt for Boats 2 to 4 ft. \$8.50 value.....3.98	6" x 6" x 6".....3.50
Keying Switch......50	Peterson 27.255 M C Z-9 Crystal.....4.85	Neon Bulbs 15 for 1.00	10" x 8" x 2".....3.98
Micro Switch......98	Resin Core Solder, Kesters 3 ounce box......50		
Photo Elec. Cell......98			
Variable Resistor......50			

25c NEW and FULLY REVISED Radio catalogue. Shows parts as low as 1/4 to 1/2 the price you normally pay. Also gives more details, more photos etc. of our kits.....25c

MODELLERS—Check off each item you wish to order above. PRINT YOUR NAME AND ADDRESS on a separate sheet of paper with above order. Send REMITTANCE IN FULL.

RADIOMODELS, BOX 36, DEPT. M BALTIMORE 6, MARYLAND

NO WONDER

Consolidated

IS THE LEADER

FABULOUS

LOOK AT THE BIG-PLUS FEATURES

- Formed Landing Gear
- AAA Balsa Thruout
- Plastic Spinner
- Formed Plastic Wheel Pants
- Scale Pilot
- Big Plastic Canopy
- Colored Decals
- Die Cut Ribs, Formers, Plywood Parts

FULL SIZE PLAN

Ask Your Dealer About Remarkable SUPA-NOTE—the Superior Model Finish

19-35 DISPLACEMENT ENGINES

ANOTHER

'FIRST' BY CONSOLIDATED

SCALE TEAM PROTO



PERCIVAL

MEW-GULL

FAMOUS ENGLISH RACER

Fuselage: 27 inches Wingspan: 33 inches

\$6.95 ONLY

AT LEADING HOBBY SHOPS

FREE

circular on this and other Famous Consolidated Models

The real difference in CONSOLIDATED kits is more than meets the eye. DESIGN, PERFORMANCE AND DURABILITY are the things you will discover after you have built and flown any CONSOLIDATED kit. SO EASY TO CONSTRUCT. A real treat for beginners. Time savers for experienced modelers.

Consolidated

MODEL ENGINEERING CO.

3087 THIRD AVE., NEW YORK 51, N. Y.

CONSOLIDATED MODELS. DESIGNED BETTER. BUILT BETTER. FLY BETTER.

across, and occupying about 90 degrees of the cylinder circumference. Below them are four similar ports through which the intake is effected from a 1 1/4 in. bore induction pipe. Another set of four ports in the front wall of the bore comprise the bypass intake ports. Discharge from crankcase to bypass passage is effected through two piston skirt ports 17/64 in. in diameter which register with two similar ports in the lower part of the bore.

Twenty years ago, the average model aircraft engine was operated at speeds of between one-third and one-half those common today. Four to five thousand rpm, using 14 in., 15 in. or even 16 in. diameter props, were usual with a Brown. With the types of models then being built, of course, there was little demand for high propeller speeds or high power outputs. Most .60 engines were nominally rated as "1/5th horsepower motors." Such an output was generally available at somewhere between 4000 and 5000 rpm, although, in actual fact, a peak power of about 1/4 hp. could be obtained in the region of 6000 to 7000 rpm.

This is indicated by our test figures for the Model D, which, it will be observed, actually produced the quite commendable output of 0.258 bhp at 6,200 rpm. This horsepower figure, it will be noted, roughly corresponds with that for a good, modern contest engine of .15 cu.in.—one-quarter of the Brown's displacement—a remarkable commentary on the progress that has been made in model engine development.

We must not lose sight of the fact, however, that the modern engine has to peak at revolutions 2-2 1/2 times as high as the Brown and will probably be using a prop of only 8 in. diameter or less. The Brown, on the other hand, will be delivering its maximum power on a 13-14 in. prop. Prewar gas models were, of course, relatively large, generally spanning (for a Brown) around 7-8 feet and weighing 6 or 7 lbs, and the Brown was certainly far better suited to this type of model than would be a high-speed modern small engine.

Due to their small piston area, model gasoline engines gain little benefit from the anti-knock value of high octane fuels, and plain, unleaded white gasoline is generally to be preferred, especially for low compression engines like the Brown Junior. For our tests, therefore, a 3 to 1 mixture of S.B.P.4 spirit (of approx. 60-62 octane rating), blended with SAE 60, motor 60 oil was chosen.

All Model B Browns and some Model C's, were equipped with a choke device over the carburetor intake. This was not fitted to the Model D and one must resort to the now common finger choking method. The procedure for starting is to open the needle-valve to the approximate setting, retard the ignition, close the air intake and begin flicking the prop. The intake is completely uncovered only when the engine is actually firing. The engine starts quite easily.

There is, of course, a great deal more control over engine speed with a motor of this kind, than with the modern glow and diesel types. Apart from the fact that the engines will run happily while swinging really big props, it is also possible to throttle right down to less than 1200 rpm, still two-cycling, by means of the timer advance and retard control, plus slight readjustment of mixture strength.

Another feature of the Brown is, of course, its very modest fuel consumption and relatively clean running, little residual oil being thrown out. One of the troubles that plagued pre-war modelers was the oiling of plugs and points, but this was not experienced during our test of the Brown,

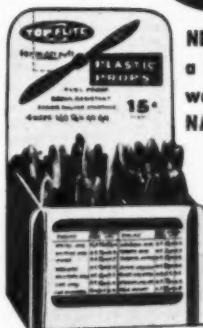
HERE'S WHY THESE CHAMPS USE TOP FLITE PLASTIC PROPS!

*** ALL FIRST PLACE WINNERS
at the 1956 NATIONALS!**

Glen Carlile, Duncan, Oklahoma
1/2A—F.F. SENIOR WINNER
using 6-3 PLASTIC TOP FLITE
said: "I used TOP FLITE
plastic because I needed
a very high RPM and
their 6-3 filled the bill."

Lee Hines, Torrance, California
R.O.W. GAS SENIOR WINNER
using 6-3 PLASTIC TOP FLITE
said: "TOP FLITE plastic
props give my plane
more altitude and get
the most out of my en-
gine's RPM's."

Bob White, Corpus Christi, Texas
(pictured at left)
FLYING SCALE F.F.—JR. & SR.
WINNER using 5/4-4 PLASTIC
TOP FLITE
said: "The new TOP
FLITE plastic props are
really tops."



• look for this counter
display cabinet at
your favorite hobby
shop

• ask your hobby dealer
for a FREE TOP
FLITE PROP CHART

TOP FLITE

**NEW PLASTIC PROPS... out only
a few months... and already
were selected and used by 1956
NATIONALS WINNERS!**

They're scientifically de-
signed and manufactured to
meet TOP FLITE'S high stand-
ards of precise engineering
for higher performance! TOP
FLITE plastic props are mold-
ed of durable, mar-proof,
and hot fuel-proof plastic to
give easier starting, more
P-U-L-L per flight and more
flights per prop. That's why
they're the CHOICE OF
CHAMPS!

4 sizes:
5/4-3 5/4-4 **15¢**
6-3 6-4 each



TOP FLITE

also makers of famous wooden TOP FLITES & POWER PROPS

TOP FLITE MODELS INC. 2635 S. WABASH AVE., CHICAGO 16, ILLINOIS

even after protracted low-speed running.
Not many Brown Juniors are still
around today and engine collectors hoard
them jealously, (we heard of one enthusiast
who has fourteen of them). Like the Model
T Ford, the Brown Junior remains dear
in the memories of old-timers—and with
equal justification.

GENERAL DATA

Type: Single-cylinder, air-cooled, spark-
ignition, 3-port loop-scavenged two
cycle.
Displacement: 0.6013 cu.in.
Bore: 0.875 in. Stroke: 1.00 in.
Compression Ratio: 6.5 : 1
Stroke/Bore Ratio: 1.143 : 1
Weight: 7.25 oz. (bare engine with spark-
plug and timer)

TEST DATA

Fuel: 3 parts SBP.4 white gasoline, 1 part
SAE 60 mineral-oil.
Ignition: Hurler 1/2 in. spark-plug. Special
6-volt ignition system. Point gap
.010 in.
Maximum Output: 0.258 bhp at 6200 rpm.
Maximum Torque: 0.26 lbs/ft at 3500 rpm.
Maximum BMEP: 32.5 lbs/sq. in. at 3500
rpm.
Maximum revolutions on 16 x 8 prop:
3250 rpm.
Maximum revolutions on 14 x 6 prop:
5400 rpm.
Maximum revolutions on 13 x 6 prop:
6500 rpm.
Minimum steady speed on 16 x 8 prop:
1150 rpm.
Power/Weight Ratio: 57.3 bhp/lb.+
Specific Output: 26.0 bhp/litre.
(Based on bare engine weight and not
including tank, ignition-coil, condenser,
battery, wiring, etc.)

Make that Model Fly

(Continued from page 29)

bad stall recovery characteristics when
it accidentally stalls; a slight stall can
build up into repeated, ever increasing,
galloping stalls. Taking too much angle
out of the wing does the same thing.
Which way to turn? Eventually, the model
will have to be so adjusted that it will
turn in a big circle while gliding after
the propeller stops running, otherwise a
mad chase will result on every flight or
perhaps the model will be lost. Which way
you want the ship to turn, depends mostly
on the designer's layout of the model.
For example, the lower the wing is po-
sitioned on the fuselage, the more pro-
nounced the model will want to turn to
the left while the engine is running. It
would not be desirable to make the plane
turn left in the glide as well for the com-
bination of forces may overwhelm the
plane and make it spiral into the ground
under power. A high wing location, with
a high cabin profile, or a pylon as on
contest free-flight models, has an op-
posite effect, and a righthand glide may
not be safe. But why monkey shines?

Well, first, the turning propeller ex-
erts a force called torque (in addition to
thrust) which makes the model roll to the
left (when viewed from the rear) opposite
to the direction of the prop's rotation.
But, at the same time, there is a twisting
slipstream blowing back from the propeller
which strikes against left side of the high
fuselage, the pylon and even the vertical
tail, making the model roll to the right.
So, in some designs, notably low wings,
the torque is much greater than the slip-
stream effect and the ship wants to roll
and turn left under power, whereas, in



**OH! IT'S
RELIABILITY
YOU WANT!**



THEN THE NAME TO BUY IS

Babcock

**FOR EVERYTHING IN
RADIO CONTROL
ALL LICENSE FREE!**

★ 27 mc EXCLUSIVE TONE CONTROL

Single Channel — Three Channel
Receivers and Transmitters

★ 465 mc EXCLUSIVE TONE CONTROL

Single Channel and
Simultaneous Two Channel
Receivers and Transmitters

★ ACTUATORS — for Boats and Planes
MARK II Escapement, Motor and Engine
Controls, Servos and Subminiature Relays

"BREEZY JUNIOR" R/C AIRPLANE KIT
"LITTLE BREEZE" R/C BOAT KIT

Easy to Install and Operate
Always Trouble Free

BABCOCK MODELS INC.

14701 Lull St. Box 1144 Van Nuys, Calif.

ADVERTISING INDEX—FEB. 1957

Ace Radio Control	46
American Telasco, Ltd.	57
America's Hobby Center	6, 7, 8
Austin-Craft	52
Aviation Photo Exchange	49
Babcock Models, Inc.	61
Berkeley Models, Inc.	63, 64, 3d cover
Bonner Specialties	55
CG Electronics Corp.	45
Cleveland Model & Supply Co.	48
Comet Model Hobbycraft Co.	1
Consolidated Model Engineering Co.	60
L.M. Cox Mfg. Co.	42, 43
Craft, Model & Hobby Industry	49, 55
The DeBolt Model Engineering Co.	44
Deifron Co.	59
Distributors' Page	59
Dunham Hobbies	2
Dynamic Models, Inc.	55
Ectron Products Co.	45
Electronic Specialty Supply Co.	49
Edward J. Farley	45
Forster Bros.	51
Fox Manufacturing Co.	2nd cover
Carl Goldberg Models, Inc.	58
Grish Bros.	47
Paul K. Guillow, Inc.	47
Gull Model Airplane Co.	3, 37
Herkimer Tool & Model Works	5
Hobby Industry Assn.	52
K & B Allyn Co.	3
Kal-Lan Controls Co.	2
Key Specialties	49
Lafayette Radio	53
Model Trains	58
Miniature Aircraft	54
Monogram Models	56
Octura Models	55
Ohlsson Manufacturing Co.	46
Pactra Chemical Co.	4th cover
Polk's Model Craft Hobbies	51
Radiomodels	60
Scalemaster Models, Inc.	38
Scientific Model Airplane Co.	40, 41
Sig Manufacturing Co.	54
Victor Stanzel & Co.	50
Sterling Models	34, 35
Stewart Lundahl	42
Testor Chemical Co.	32, 33
Top Flite Models, Inc.	61
Veco Products Corp.	39
World Engines	36
X-Acto, Inc.	50
C.A. Zaic Co., Inc.	54

410M PRODUCTS



HOBBY SPRAY GUN

operates from vacuum cleaner

Only \$3.75

Sprays any type of paint, dope, vinyl, lacquer or water base paint. Is chrome plated for easy cleaning and protection against chemical action. Will spray up to 10 sq. ft. with one filling of 48cc jar.

Equipped with attachment to vacuum cleaner hose, but other sources of air may be used. Made especially for the hobbyist and do-it-yourself fan. Simple and easy to operate and clean. No moving parts, always in adjustment.

sold at your hobby shop
stewart/lundahl co.

7342 Fulton Avenue
North Hollywood, Calif.

Manufacturers of 410M paints and adhesives for the model and hobby craftsman

the pylon type layout, the slipstream may be the more powerful and the model will want to spiral to the right. At a magic point in-between (good for RC) the ship will want to fly straight under power.

It is rather tricky to fully adjust the model for its glide turn, before it makes its first short, low-power flight. Turn adjustments can be made by bending a movable rudder or rudder tab, or by tilting the stabilizer. Since bending a rudder or tab has great effect on the power flight, too, it is better to tilt the stabilizer, whenever mounting allows this to be done. When viewed from the front of the model, the glide turn will be in the direction of the higher stabilizer tip. Strangely, tilting the stabilizer has small effect on the power flight, so it is a good adjustment to separate the glide adjustments from the power adjustments.

First power flight: For sport and simple models, this should be made at about half power. Run the engine rich. Use a timer to limit the flight to 10 seconds or so. Don't ever fill the tank—in case a timer fails, you don't want to fly-away. Or use a small tank whose duration you know from engine-run tests in advance.

Here's what we are shooting for: though the glide trim may be correct, it is quite probable that the model will stall when the engine runs. It may dive but this is very unlikely. Regardless of what faults the model exhibits under power, never correct them by the same measures used for the glide portion of the tests. If you do so, the glide will be fouled up, and you will have to begin all over again. If the model stalls under power, the engine may be tilted down. The resulting down thrust then tends to hold down the nose.

A mid stalling tendency under power is desirable if the model is flying straight. A mild stall then can be corrected, either in the glide or under power, by making the plane circle or turn. And you want it to turn. If the model does not have a natural power turn you can make the model turn by adding right thrust, or tilting the engine toward the right. The rudder or rudder tab may be offset, for a turn under power, but this can be dangerous as the effect will be increased whenever the plane flies faster. Tremendous down thrust usually is required if the model is to fly straight under power.

Sometimes a rudder or tab adjustment will be safe. If, for example, a model has a pronounced turn tendency under power to begin with, slight opposite rudder will decrease the amount of banking. (Such as left rudder on a right turning pylon,

or right rudder on a shoulder or low wing that likes to spiral to the left. But in these cases, the rudder adjustment can be used only up to the point where the glide turn is caused to tighten up. Then thrust line adjustments would be better. Apparently, it is not good to "rudder" the ship into power turns but it is safe to rudder it out of power turns to a limited degree.

On the first few power test hops, we are interested only in getting the model airborne safely and back on the ground without damage. Don't expect to obtain a precise power adjustment right off the bat. This short power hop will provide a chance to observe the glide under better conditions than was possible in hand gliding. You may want to affect further improvements on the glide path, until the plane circles smoothly, not diving or stalling at all, and not gliding on a straight path. Remember that tilting the stab more to increase turn, will take out a mild stall in the glide. Conversely, if the turn is too tight, and the speed too fast, remove some stabilizer tilt to open up the glide circle and to make the plane fly more slowly.

The final touches: Once the glide is perfect, you can concentrate fully on the power portion of the flight, making corrections to the thrust line as necessary to hold down the nose or to compel the plane to circle, more or less, while the engine is running. Trimming the model is a patient step-by-step procedure. If the power flight is very poor at the beginning, with extreme stalling or turning tendencies, it is obvious that these dangers must be lessened before you can go on polishing the glide adjustments. But as soon as the engine run doesn't threaten disaster, you can go back to flight-by-flight improvements of the glide. Of course, these additional small corrections of the glide will have effects on the power flight, so you will have to continue making fine adjustments to the thrust line to bring the power flight back into line after the glide has been altered.

Finally, when the glide is perfect, and the power flight reasonably safe, you can begin to add more and more power. Once you have a satisfactory propeller, never change diameter or pitch or, for that matter, the brand. Torque and slipstream will be altered and your patiently adjusted ship may crack up. A propeller change calls for new power tests. Further minor adjustments to the thrust line then may become necessary.

MODEL AIRPLANE DESIGN



(4th printing) Complete Instructor on Model Flying, by C. H. Grant, foremost authority on model airplanes since 1911, also former editor of "Model Airplane News" magazine. . . . This work presents in one comprehensive volume all the fundamental data on which successful model flying is based. It teaches anyone how to design and

build models scientifically, eliminating wasteful "cut and try" methods. It answers a thousand model questions; has become the modeler's favorite reference volume.

Model Airplane Design is also a Basic Trainer for Aviation: it gives thorough training in rules governing all flight, model and large planes. Here's the all-important first step in your aviation career!

For both beginners and advanced students.
328 pages. 205 Diagrams and Plans...\$3.75

AIR AGE INC., 551 FIFTH AVE., NEW YORK 17, N. Y.

A-1 GIFT FOR MODELERS!

RC FIELD BOX by Broadfield

UNIQUE COMBO SUPPLY CASE . . . with "HOLD-A-PLANE" BRACKETS & LEGS.



* AT LAST—the first truly double-duty field box that simplifies plane servicing. PROVIDES: wash-high stand to prepare your plane for flight, with ample space for tools, meters, fuel, etc. PREVENTS: laborious stooping and kneeling; injuries to person or plane parts.

• **EZY-TO-BUILD KIT**
• All parts pre-fab 1/4 in. plywood
• Shaped-adjustable brackets
• Hardwood shaped-legs
• Hdw. glue, color decal, etc.
• Assembly plan
• Designed for RC or FF

• **J-7F RC Field box kit**
\$10.95 Post Pd.
• **J-7F RC Field box built-up**
\$17.95 Post Pd.

SEE YOUR DEALER OR ORDER DIRECT
BROADFIELD AIR-MODELS ASHLAND, MASS.

Berkeley's R.C. FLYING SCALE



Radio Control Free-Flight Control Line

CESSNA "172"

BIG 1 1/2" SCALE - 54" WINGSPAN

Adjustable Ailerons for manually setting trim .09 to .19 Engines **\$7.95**

- Operating Wing Flaps
- Laminated Structure

Here is the latest scale "Colonia" that is a "natural" for radio control. The big props she takes off and lands with "hands-off" control. The model handles just as easy! It's a model builder's dream ship!

Radio Control - Free-Flight - PAB-Load



For .18 to .35 Engines - 71" Span - 2" Scale

"PIPER CUB J-3"

The "Piper Cub J-3" needs no introduction. Most famous of all light aircraft, it's a natural for R.C. or Free-Flight flying. The six foot span permits the extra R.C. installation that you dream about.

2" Scale - 68" Wingspan For .33 to .65 Engines



Radio Control - Free-Flight - Control Line

NAVION "Super 260"

This beautiful scale replica of the famous "Navion" is a fast, rugged and truly different R.C. or Free Flight design, easily adapted to Control Line flying. Thrill to its flashing performance and smooth response.



For Radio Control - Free-Flight - PAB-Load

For .33 to .65 Engines - 71" Span - 2" Scale

Controlling your "Cessna 170" by Radio is a thrill you will not forget! Perfect in scale, rugged, stable in all attitudes, yet responsive in control, with good wind penetration qualities. The gear location is ideal for extended take-off runs. The larger-than-average size makes it easier to control in windy weather.

Formed Metal Ring Cowl

.035 to .15 Engines



Radio Control - Free-Flight - Control Line

"BEAVER"

This high aspect-ratio Canadian Bush Flying type aircraft now is in use by the U. S. Air Force. As a scale design, it is well proportioned and capable of contest performance. In R.C. and Control Line flying, its long moment arm make it ideal for spot landings with motor control. Metal Cowl, Full Size Plans, etc.

Radio Control - Free-Flight - Control Line

.035 to .15 Engines



64" Wingspan

"TRI-PACER"

This perfect scale R.C. design may be built as a Free-Flight or Control Line version if desired. Full Size Plans cover special details for all three versions. Flaps, elevator, rudder, motor and nose gear may be operated by R.C. Ailerons for trim, cabin door access to Radio. Highly Pre-fabricated. Authentic Decals.

BERKELEY

Berkeley's SCALE



North American **\$13.95** 3-10

B-25 "MITCHELL"

For .09 to .019 Engines - 1/2" Scale - Big 42" Wingspan

With twin engines screaming, the B-25 roars across the field, to 100 feet it's airborne and the gear retracts. Perfect for the Navy Carrier event, this detailed scale replica is easily assembled from this masterful kit.

3-WHEEL RETRACTABLE SHOCK MOUNTED GEAR

OPERATING WING FLAPS



3-7 **\$4.95**

CURTIS HAWK "P-6E"

For .09 to .15 Engines - 1/2" Scale - 25" Wingspan

The Curtiss Hawk "P-6E" is one of the great historical models of the Air Force. It was our best pursuit ship of the early 1930's. Berkeley's model is authentic, scaled without deviation from nose service manuals supplied to us by the Air Force Technical Museum. The complete details for the famous "17th Pursuit Squadron" from Selfridge Field, Mich. make it a really beautiful model to own and fly.

Metal Cowl! Metal Wheel Pants! Metal Wing Struts!

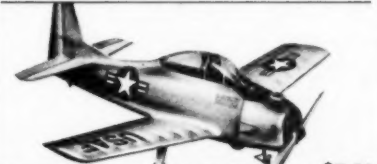


3-15 **\$6.95**

"P-40 WARHAWK"

SEMI-SCALE STUNT For .19 to .35 Engines 45" Wingspan

This kit brings scale realism to stunt flying. It's a beauty on the ground as well as in the air. Start building it now, and be a winner next season.



3-5 **\$5.95**

North American "T-28"

For .23 to .36 Engines 30" Wingspan

This new Air Force Trainer aligns itself on the Step-East, included in kit. Six-cylinder landing gear, metal cowl, bubble canopy, U-Cowl.



3-4 **\$4.95**

NORTH AMERICAN AT-6 "TEXAN"

(U. S. Navy designation SNJ) Most widely used military training aircraft. More than 10,000 were built in the U. S. and Canada. Used by all the Allied training commands and still widely used today. Powered by a 550 h.p. Pratt & Whitney R-1340 engine. 212 m.p.h.

(U. S. Navy SNJ-51) .19 to .33 Engines .31" Wingspan



SEMI-SCALE STUNT 3-16 **\$7.95**

GRUMMAN "GUARDIAN"

Powered by a 2,400 h.p. Pratt & Whitney R-2800 fourteen cylinder radial engine. Carries over of four Range 1,500 miles-maximum speed 315 m.p.h.

53" Wingspan .19 to .45 Engines

Berkeley's BOAT KITS



HINKLEY "CUSTOM 36"

\$16.95 5-3

FIRST SCALE AUXILIARY SAILBOAT FOR RADIO CONTROL

BIG 1" Scale - 36" Hull Length

Heavy Reinforced Plastic Hull

Mahogany Superstructure

Full Rigging and Sails

Marine Deck Hardware



Chris-Craft 22" Long **\$3.95** CC-4

"22" EXPRESS CRUISER

SINGLE OR DOUBLE OUTBOARD ELECTRIC OR GAS MOTORS

Here is the boat large enough for radio control at the price of many smaller models. There is real fun in store when you build and sail this big, big model.

INBOARD - "1/2 A" GAS OR ELECTRIC



Chris-Craft 16" Long **\$1.95** CC-7

"16" CUSTOM RUNABOUT

OUTBOARD GAS OR ELECTRIC MOTORS

Imagine a big, beautiful, mahogany, true-scale Chris-Craft for such a low, low price. A model boat that has everything and gets up and moves!



Chris-Craft 32' CRUISER

RADIO CONTROL OPTIONAL!

32" High Impact Vacuum Formed Plastic Hull CC-5

At your Dealer or via Railway Express Collect. **\$16.95** For up to a .39 Gas Engine or two Miniature Electric Motors.



Chris-Craft "COBRA"

1 1/2" = 1" Scale - 31 1/2" Long CC-6 .09 to .35 Engines

Build this big Mahogany planked scale replica of Chris-Craft's 1935 Sport Boat. Engine Compartment completely separated from optional Radio Control gear.

\$9.95

RADIO CONTROL OPTIONAL!

Full Size Plans with R.C. Details

Die-Cut Mahogany Veneer, Balsa, Plywood

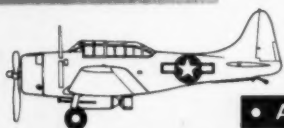
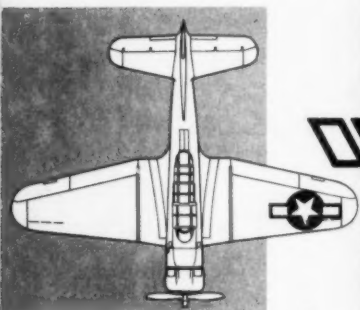
Celluloid, Deck Hardware, Decals

Scored Decking

Authentic in Detail... Thrilling in Flight

Berkeley

presents the



**DOUGLAS
SBD**

KIT Only
\$6.95

"DAUNTLESS"

NAVY DIVE BOMBER

Controliner

For .14 to .36 Engines—31" Wingspan — 1/4" Scale

• Automatic Dive Brakes

• Formed Wire Landing Gear

• All Necessary Hardware

• Carved and Hollowed Fuselage

• Die-Cut Balsa and Plywood Parts



• Formed Celluloid Bubble Canopy

• "U-Control" Elevator

• Authentic Detail

• Rubber Wheel

• Metal Engine Ring

• Full Size Berkeley Detailed Plans



In July of '44, the 5,936 SBD "Dauntless" rolled off the line, last of a truly great aircraft. Designed in 1939, it was obsolete when Pearl Harbor was attacked. It winged its way across the Pacific and the North African theatre. It has been credited with turning the tide of battle at Midway and the Coral Sea. Its loss ratio was the lowest of all Carrier aircraft in the Pacific theatre. It could withstand terrible punishment and often staggered back on wings shot to pieces. Span was 41'6", speed 253 m.p.h. 1200 horsepower, 1600 lb. bomb load, four machine guns.

Since 1944—Leader in Creative Model Kits...
BERKELEY MODELS INC.
WEST HEMPSTEAD, NEW YORK, U.S.A.

If no local dealer is convenient, mail orders will be filled by Berkeley Model Supplies, Dept. BBA, West Hempstead, N.Y. Please include 25¢ postage & postage.

As a flying scale design or Navy Carrier type model, the plane is a beautiful flyer. Easy to control, responsive with excellent take-off and landing qualities. The automatic dive brakes can be made to operate for landings if desired, rigged to open on full-down elevator. With motor cowling added, you can make realistic power-on carrier landings.

Assembly time is very very low, thanks to the carved and hollowed fuselage blocks, the metal ring cowling, bubble canopy and other fabricated parts. You'll be proud of

Berkeley's

Pre-Fabricated

CHAMPIONSHIP

"1/2 A" FLYING SCALE

1" = 1' Scale ... For Free-Flight ... Controline ... or Rubber Power!

For .035 to .049 Engines Free-Flight049 to .099 Engines Controline (except as noted)

Each year from all over North America, the top Scale Model Builders come to the Nationals ... to fly in the exciting Flying Scale Event where models are judged for workmanship, authenticity and most of all — flying performance! Against this keenest of competition, Berkeley's Flying Scale designs have won 1st or 2nd in this event at every Nationals' for the last 18 years!!

We are proud of this extraordinary record.



\$2.95

PIPER "SUPER CRUISER"

35" Wingspan

Three place cabin monoplane originally introduced as the "Cruiser" in 1940 with 75 h.p. then as the "Super Cruiser" after World War II, with 104 h.p. and then in 1948 as the four place "Family Cruiser". "Super Cruiser" had a maximum speed of 115 m.p.h.



\$2.50

CULVER "V"

29" Wingspan

This low-wing sport plane turns in long stable flights. The tricycle landing gear adds realism to landings.

Each Kit Contains:

- Authentic Multi-color Decals
- Formed Gear, Rubber Wheels
- Die-Cut Balsa and Plywood Parts
- Metal Hardware and Covering Material
- Full Size Berkeley Detailed Plans!



\$2.50

STINSON VOYAGER "150"

34" Wingspan

Originally built by Stinson division of Consolidated Vultee. Added to the Piper line in 1948. Four place 165 h.p. Franklin engine. 145 m.p.h. maximum speed.



\$2.95

CESSNA L-19 "BIRD DOG"

36" Wingspan

The best observation plane used on a large scale in Great War by the U.S. Army and the U.S. Marines. A large number of these are used by National Guard units. Powered by 213 h.p. Continental-130 m.p.h.

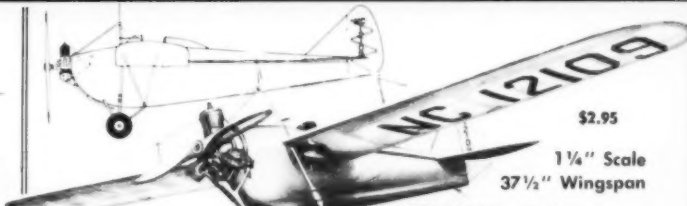


"SUPER CADET"

35" Wingspan

\$2.95

Known as the "Interstate Cadet" before World War II and currently built by Calt Aircraft Co. Two place—power was 65 h.p. It is now stepped up to 125 h.p. with an increase in maximum speed to 135 m.p.h.



\$2.95

1 1/4" Scale
37 1/2" Wingspan

"BUHL PUP"

The Buhl Pup has been immortalized as one of the finest light planes ever designed. A number of full scale "Buhl Pups" are being rebuilt by "old timers". This truly different design makes an exceptionally realistic and fine flying model.



N6595K

COLONIAL "SKIMMER"

(Not for Rubber Power) 33 1/2" Wingspan

The hull design is perfect for realistic water take-offs.

Three place amphibian with retractable landing gear. Main wheel protrudes when retracted to serve as a bumper. Powered by 125 h.p. Lycoming. 125 m.p.h.

\$2.95

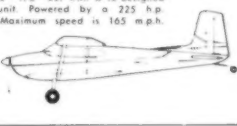


CESSNA "180"

35" Wingspan

\$2.95

Four place cabin monoplane introduced in 1953 using the same wing as the "170" but with a re-designed fuselage and tail unit. Powered by a 225 h.p. Continental Engine. Maximum speed is 165 m.p.h.



\$2.50

"AERONCA SEDAN"

34" Wingspan

Four place light cabin monoplane. Powered by 145 h.p. Continental engine. Speed—129 m.p.h.

Featured as a landplane, plans show pontoon details for those desiring the added thrill of water take-offs. Finished model is really spectacular.



\$2.50

STINSON SENTINEL "L-5"

33 1/2" Wingspan

Two place liaison and observation plane first flown in 1941. 1731 L-5's were built during World War II. Still in use by the U.S.A.F., Italian Air Force, and the Japanese Air Defense Force. Powered by 190 h.p. Lycoming. Maximum—129 m.p.h.—112 m.p.h. Cruising.



\$2.50

FAIRCHILD 24 "RANCHER"

36 1/2" Wingspan

First produced in 1933 as a two-seater, in 1938 was introduced as a four-place model using either a radial Warner engine or an inline Ranger. Military version was known as the VC-61 "Forwarder" by the U.S.A.F. and the "Argus" by the R.A.F. Production resumed for business use after the war. 122 m.p.h.

Since 1933—Leader in Creative Model Kits...

BERKELEY MODELS INC.,

WEST HEMPSTEAD, NEW YORK, U.S.A.

If no local dealer is convenient, mail orders will be filled by Berkeley Model Supplies, Dept. MA., West Hempstead, N.Y. Please include 25¢ packing & postage.

pactra 'namel has it!

*fullest authenticity for
plastic models with...*

New FLAT COLORS

Famous manufacturers are recommending "flat" colors for painting their latest plastic model plane, ship, vehicle and railroad kits to achieve their fullest authentic appearance. Again Pactra chemists have met this requirement with the highest quality paint—specifically for the job! Faster drying, dependable for any type of plastic, these 12 new authentic "FLAT COLORS" will make your models completely realistic! Ask Your hobby dealer for PACTRA 'NAMEL in...

FLAT BLACK
FLAT YELLOW
ANTI-GLARE GREEN
FLAT INSIGNIA RED
FLAT BATTLESHIP GRAY
FLAT ALUMINUM

FLAT WHITE
FLAT RED
COPPER
FLAT INSIGNIA BLUE
FLAT ROOF BROWN
FLAT ORANGE-YELLOW



Ask for the best... it's only **15¢**



Model builders favorite painting kit...

pactra
big 12
DELUXE SET

Complete finishing kit with brush,
C-Ment, Thinner and assorted colors of
brilliant Pactra 'Namel

98¢

The Touch of Quality for Every Hobby

pactra CHEMICAL COMPANY 1213 NORTH HIGHLAND AVENUE, LOS ANGELES 38, CALIFORNIA
Factories: California — Massachusetts



15

ORNIA